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The Job Higher Up

By R. T. STROHM

There are times when toil grows dreary
And the world seems none too kind,
And the worker's frame is weary
With the long-continued grind;
And the thing that keeps him going
When his nerve and strength have fled
Is the hope that comes with knowing
There's a better job ahead.

He is sure to be more willing
And less apt to lag and droop
If he knows that oil-cup filling
Or the swinging of a scoop
Will not haunt the years remaining
With its humdrum, but, instead,
Give experience and training
For the better job ahead.

He will throw his best endeavor
Into every phase of work,
And the chances are he'll never
Be a loafer or a shirk
If his modest occupation,
Though it yields him meat and bread,
Is a sort of preparation
For a better job ahead.

Nothing kills his high ambitions
Quite so thoroughly as when
He observes advanced positions
Go to new and unknown men;
So you really cannot blame him
If his spirit's dull and dead,
When you don't intend to name him
For the better job ahead.

Reprinted from Power

Ideas and Suggestions

Bullseye Plumb-Bob Reflector

By H. A. SCHMIEDING*

Descriptions have been given in *Coal Age* of reflectors for illuminating the plumb bob in underground surveying. A late article mentioned the possibility of other suggestions for reflectors which would be better than those described.

About a year ago I "evolved" a reflector that has proved quite efficient, being durable, of small size (it



THE REFLECTOR IN USE

can be carried in the pocket), cheap, easily made and can be held in the proper position with the lamp, in one hand, leaving the other free to align the bob in setting line sights. The manner in which this is done, as well as an idea of the construction, is shown by the illustration.

The frame of this reflector, or "bullseye," as it is called, is made by cutting the centers from two "push" lids from lard or syrup pails (the kind that are removed with a knife, screwdriver or coin), obtaining a ring about $\frac{3}{4}$ in. wide with a raised edge from each lid. Two circular sheets of clear mica cut to a little less than the outer diameter of the frame (not the hole) with "onion skin" paper between, form the ground or field. The paper is more transparent than tracing cloth, but is still sufficiently opaque to offer a good background when illuminated. It is also less affected by heat or moisture.

As the frames cannot be forced together close enough without distortion to clamp the mica, two ring gaskets

of heavy blotting paper are placed between the mica and the tin, one on each side. This prevents the mica and the paper from shifting and excludes dirt and dampness.

To assemble, place the various parts in one of the frames (laid with the raised edge up), place the other frame in, also with the raised edge up, and force together by pinching the flanges together around the raised edges with a pair of pliers.

When in use the lamp should be held so that the flame is parallel to the mica. The paper or mica will seldom need renewing, but when renewal is necessary it takes but a few moments' time.

A wire handle arranged to hold the lamp could be soldered to the periphery of the outer frame (so as not to interfere with taking the reflector apart), if desired, but I have not found this necessary, as the bob can be steadied with the fingers holding the bullseye and lamp, or after a little practice with the edge of the bullseye.

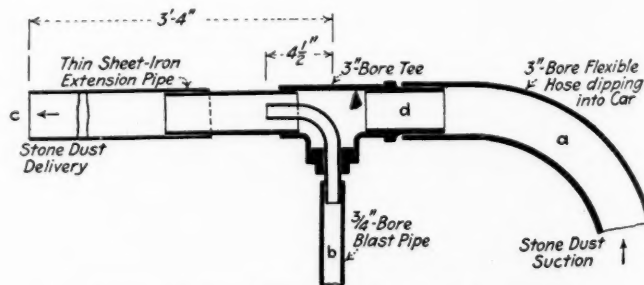
Several engineers in this section have adopted this reflector and express great satisfaction with it.

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Pipe for Cleaning and Rock-Dusting Mine Roadways

In this country we are discussing rock-dusting as one of the mild obsessions of the United States Bureau of Mines, for which we graciously pardon them. Meanwhile in Great Britain rock-dusting is being put actively into force, apparently with excellent results. But there they have less coal dust on the roads, and rock-dusting is therefore not such an almost impossible task. Their cars are tight and do not leak, and the coal they contain not being built up above the sides is not scattered along the roadway.

They clean their roads by hand, and then at least one colliery uses a jet to dislodge the dust remaining. This is shown in the accompanying illustration. It may be used as a dust dislodger or as a rock-dust distributor. When used for the former purpose, the 3-in. flexible hose



PIPE AS EQUIPPED FOR ROCK DUSTING

a is removed and compressed air is driven through the blast pipe, which is fed by the $\frac{3}{4}$ -in. compressed-air hose pipe b. This blast pipe is curved so as to discharge into the center of the 3-in. thin sheet-iron pipe c. The escaping air dislodges all the dust in the crevices of the rock.

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Reliance is placed on sprays to cause this dust to fall so that it can be collected.

After the 3-in. flexible hose *a* has been attached, its end can be dipped into a car of rock dust. When air under high pressure is allowed to flow through the blast pipe, it causes a vacuum in the flexible hose and draws the ground rock through the latter, ejecting it with violence from the orifice of the rock-dusting pipe.

There are objections to the use of the apparatus as a dust dislodger. It cannot be used when the mine is working, as a cloud of coal dust can be observed 3,000 ft. distant from the point where the ejector is at work, in spite of the use of fine sprays through which the dust must pass. G. D. Budge, speaking before the South Wales Institute of Engineers, said:

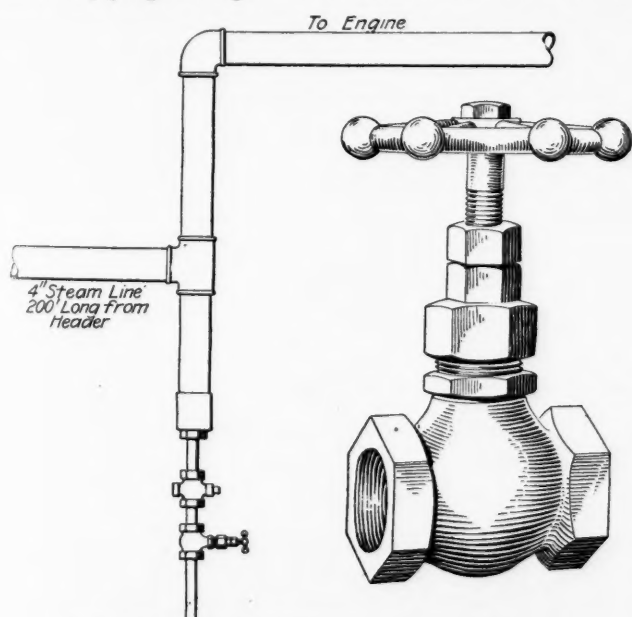
Until some arrangement is devised which will catch the dust and prevent it from escaping into the workings and return airways, the excellent work done by the ejector is of little avail. By this method a road can be made practically free of dust, but there is nothing to be gained by this if the immunity of this particular stretch of roadway is obtained at the expense of other parts of the colliery.

It would appear that a vacuum cleaner would do the work to better advantage, as it could be made to collect all the dust and preclude the possibility of dusting the interior workings with an impalpable combustible material.

Mr. Budge doubts whether the use of this pipe gives results superior to those obtained in rock-dusting by hand. In that case the dust is put on the ledges of rock with some violence, and it brings down no little coal dust from the crevices. But where there are large and high holes above the timber, the pipe cleans such holes more satisfactorily than can be done without it, and it is more successful in distributing the stone dust.

Locknuts on Valve Stem

A 16x18-in. throttle-governed engine driving a ventilating fan and situated over 200 ft. from boiler house has the piping arrangement as shown in the illustration,



VALVE STEM LOCKED TO AVOID CLOSING

for collecting and draining the condensate from the line through a 1/2-in. plug-cock and globe valve in the bleeder. Someone shut the globe valve on the bleeder at a time when we were experiencing trouble with dirty feed water,

resulting in a partly wrecked engine caused by water carrying over. To insure against further trouble of this kind we cut threads on the valve stem and put on a nut and locknut. The valve is now opened the desired amount, and the nuts are screwed against the packing nut and locked tight so that the valve cannot be closed without slacking the nuts.—Jack L. Ball in *Power*.

Pulley Computation Chart

The accompanying chart will be found to be useful for determining the sizes of pulleys required for given power-transmission requirements.

It removes the necessity for the use of the various formulae and is extremely flexible in its application. For example, a motor running 1,200 r.p.m. is to drive a lineshaft at 300 r.p.m. What sizes of pulleys should be used? On the slip of paper in position *A* make marks opposite the 300 and the 1,200, as shown. Then slide the slip of paper up to wherever you want it. Position *B* shows that pulleys 15 in. and 60 in. diameter respectively will do the work very well. Of course, if those diameters are considered too large, the slip can be moved a little higher and the best diameters can be chosen. No matter where the slip is placed, the ratio is always correct. The chart also lends itself readily to the solution of such a problem as—Knowing the pulley diameters and the speed of one of the pulleys, what is the speed of the other pulley? For example, pulley diameters of 8 and 50 in. are used. The speed of the 8-in. pulley is 200 r.p.m. What is the speed of the other pulley? The answer

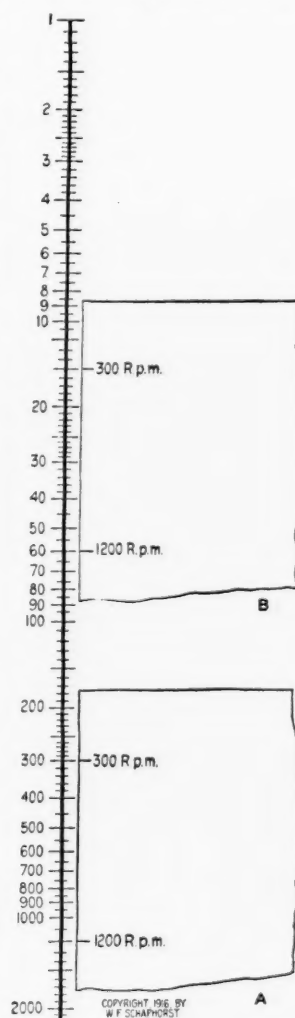


CHART TO CALCULATE PULLEY RATIOS

is 32 r.p.m. Try it by means of the chart. As speed of rotation and diameters bear an inverse ratio to each other it will be necessary to invert the figures when obtained or else reverse the slip of paper between position *A* and *B* in the figure.—W. F. Schaphorst in *Engineering and Mining Journal*.

Payment on a Lump Basis Often Develops Screen Methods

—When the operator pays the miner for all his coal regardless of size, he is free to install whatever system of screening seems good to him, and he can make his sizes meet his market conditions, since he has no agreement with his miners concerning screens. In this and in other ways payment on a lump basis causes a development in screening methods.—E. A. Holbrook in "Dry Preparation of Bituminous Coals at Illinois Mines," University of Illinois Bulletin No. 88.

A Concrete Tipple in Ohio

BY WILLIAM G. BURROUGHS*

SYNOPSIS—Concrete for tipple construction is coming rapidly into favor where permanency is required. This article describes the construction adopted for a moderate-size operation.

The wooden tipple of the Black Diamond Coal Co. near Lathrop, Athens County, Ohio, was several years ago destroyed by fire. A new tipple, shown in the accompanying illustrations, was constructed in which no chances of a similar disaster were taken. The tipple was made of reinforced concrete, the work being done by E. Elford, concrete contractor, of Columbus, Ohio.

The Black Diamond property is situated in a region the topography of which has been carved by stream erosion, leaving hills 100 to 300 ft. high, separated by rather narrow valleys. Near the base of one of these hills is the entrance to the mine. Electric locomotives haul their trips of loaded cars from the mine's entrance, 3,200 ft. down the valley, to the tipple.

At the tipple everything is of concrete, including the columns, floors, sides, roof, trestle, bins, power house, reservoir, etc. The tipple is of monolith construction. The concrete for all the parts was run, as far as possible, at the same time, making the entire structure one unit. A 1:2:4 concrete mixture was used, and it took about one week to run the entire tipple. This monolith construction is claimed to be superior to a steel tipple because the vibration is distributed over the entire structure, whereas in a steel tipple all the strain is put on the rivets, which may become loosened.

The tipple proper is approximately 100 ft. long by 30 ft. wide and 30 ft. from the ground to the main floor. The highest point of the top is 62 ft. from the ground. The columns are 18x18 in. The sides are of concrete and plastered tile. The concrete is built up 6 ft. above the main floor, so as to stop any cars that may jump the track after being dumped. Above the concrete the walls are plastered tile.

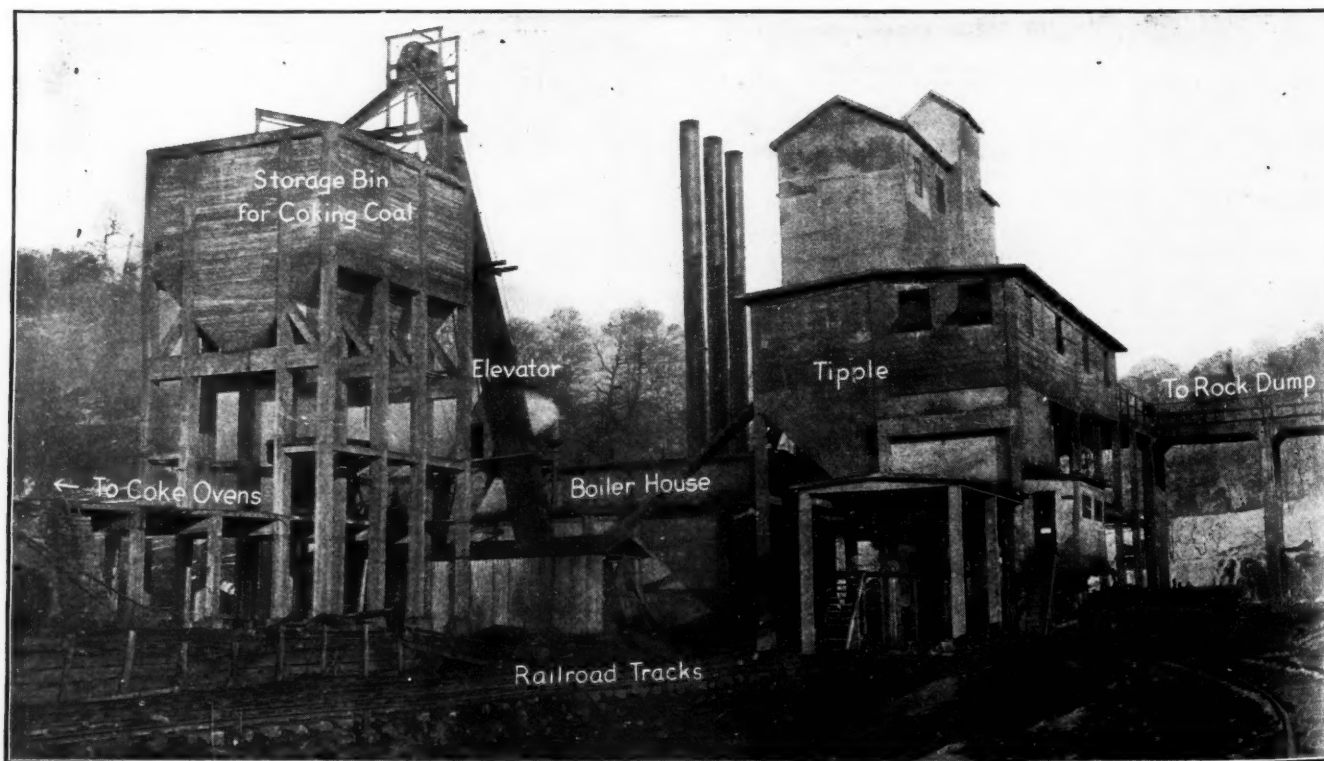
A concrete trestle, approximately 250 ft. long by 19 ft. wide, and 25 ft. high on the average, leads from the mine track to the tipple. The columns of the trestle are 12x12 in. and rest on reinforced-concrete footings; the soil in which they are sunk is clay of medium consistency. A shorter concrete trestle leads from the main trestle to a waste pile.

On the main trestle there is a switch connecting with the empty track which operates automatically. The electric locomotive coming from the mine makes a "flying switch" into this empty track, the loads continuing down the main track to the tipple. The locomotive starts back for the mine with the empty trip and by its own weight throws the switch, so that the side track connects with the main track.¹

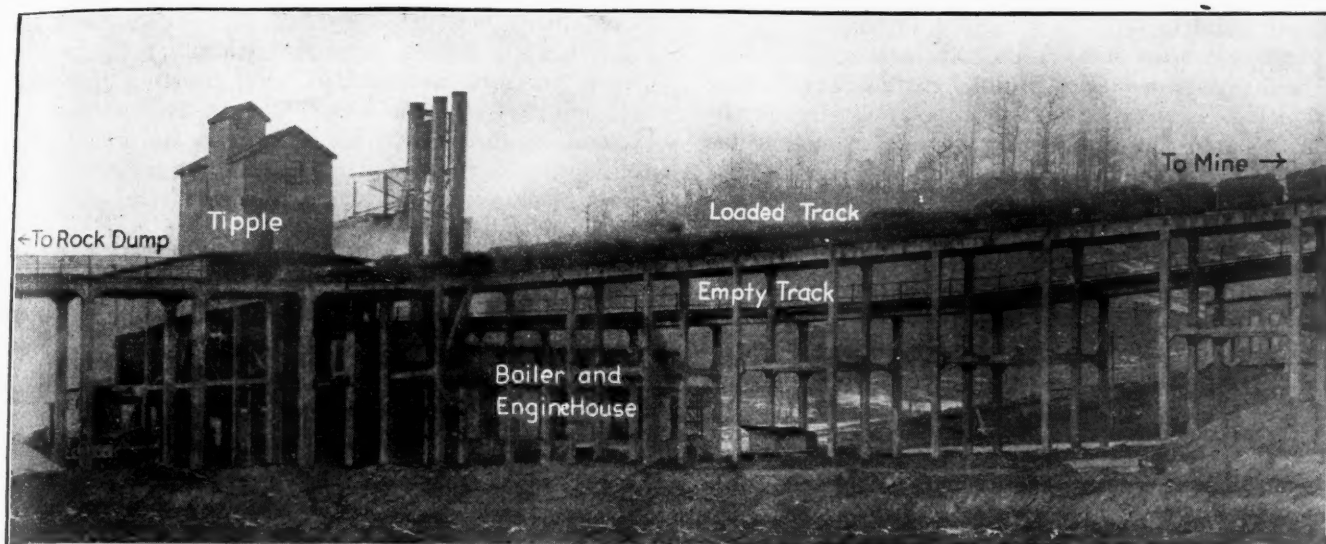
At the tipple platform the loaded mine cars are dumped on a Phillips cross-over dump, and then pass over a series of screens, the lump coal going into bins or railroad cars, as desired. The finer coal passes into an elevator hopper from which it is lifted 50 ft. by a bucket conveyor to a revolving screen which sizes the coal; it

¹For a detailed description, with illustration of this automatic switch, see "Coal Age," Vol. 8, No. 7, pp. 256, 257, "An Automatic Switch," by Wilbur G. Burroughs.

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GENERAL VIEW OF THE PLANT, SHOWING THE CHIEF STRUCTURES



VIEW SHOWING LONG TRETTLE APPROACH TO THE TIPPLE

then goes through chutes into bins from which it is loaded into railroad cars below.

The concrete power house is adjacent to the tipple, as shown in the accompanying illustrations. Coal used as fuel for the boilers goes from the top of the bucket elevator in the tipple through an outside chute into bins in the power house directly over and in front of the boilers. Enough coal is contained in these bins to operate the boilers 48 hr. From these fuel bins chutes lead downward to a short distance above the floor of the boiler room, and 5 ft. horizontally in front of the boilers, where a pile of 5 or 6 bu. of coal is kept on the floor ready for use.

The power plant consists of three 150-hp. Union Iron Works boilers, equipped with low- and high-water warning

they are crushed and elevated by a bucket conveyor into the slack bin. This bin is 24x30 ft. by 52 ft. high and is constructed of reinforced concrete. From the slack bin the coal is discharged into a larry car which carries it to the coke ovens. At the farther end of the ovens from the slack bin and tipple is a crusher for grading the coke into the various commercial sizes. Here the coke is stored in separate bins according to its size, ready for shipment by rail.

The writer is indebted to J. H. Earnshaw, president of the Black Diamond Coal Co., of Columbus, Ohio, for aid and courtesies extended in the preparation of this article; to E. Elford and H. J. Dauben for information concerning the construction of the concrete tipple and for blueprints.

[For a detailed description of the underground workings at this mine, see "The Black Diamond Coal and Coke Co.," *Coal Age*, Vol. 1, p. 1236—Editor.]

Establishment of a Colliery

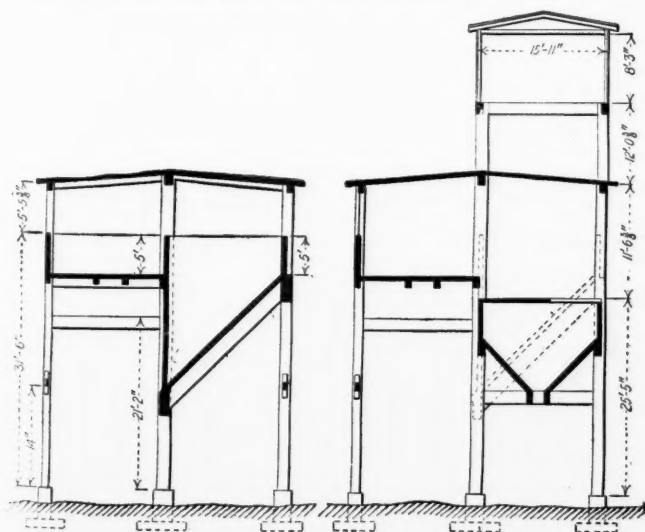
By J. F. K. BROWN*

Mining engineers engaged in coal-mining work find three periods in the life of any mine constantly recurring: (1) The establishment of a colliery; (2) the development of the colliery, and (3) the valuation of the colliery.

The first includes the initial examinations and final estimates, the figures, facts and fancies, that go to prove the possibility or impossibility of a commercial success. The second period covers the design and erection of the plant and the actual operation of the property, the time when the return on the capital investment is earned. The third period, often the most intricate and difficult, is entered upon sometimes at the commencement of operations, but more frequently at a change of ownership, or in the event of questions arising that affect increases or decreases in capital value.

Problems relative to the establishment of a colliery lead to the visualization of four hypothetical cases among which there may exist innumerable variations: (a) A coal field with no available market; (b) a coal field with a noncompetitive market; (c) a coal field with beds of good quality in a competitive market, and (d) a coal field with coals of poor quality in a competitive market.

*Sydney, N. S.



TYPICAL CROSS-SECTIONS OF THE TIPPLE

whistles, a Jeffrey 150-kw. generator and a Ridgeway 150-kw. generator.

North of the power house is a concrete reservoir holding 3,000 bbl. of water, which is pumped from a creek nearby. The water is used in the boilers at the power house.

The coal is a coking grade and hence when desired the screenings are used in coke ovens adjoining the slack bin. A chute delivers the screenings to a disintegrator where

Reports and investigations under (a) become matters of purely geological interest and thus pass automatically out with the scope of a mining engineer's attention. Shareholders in any concern that is operating where conditions (b) exist can consider themselves as possessing the proverbial "gold mine." There are here presented for solution no special engineering features beyond those relating to human safety, nor does the case call for any particular diagnosis of its commercial possibilities. Such fields are comparatively rare in the world's coal operations, and yet it is in such fields that incompetence frequently blossoms. The last two suppositions represent conditions as they exist in the majority of fields being operated today. It is with the immense variety of the engineering problems therein presented that most coal-mining engineers must necessarily deal.

STARTING AN OPERATION

Prosecution of the work that relates to the establishment of a colliery naturally falls under three heads: (1) Investigation; (2) capitalization; (3) organization.

Investigation deals with the proofs of the existence of the coal, the problems of, and all questions bearing on, after working. Generally, it provides the facts upon which the investment of capital takes place. The factors that require attention are: (a) The tenure of the areas; (b) the tonnage available; (c) the quality of the coal; (d) the markets that can be served, and (e) the cost of the coal in the market.

Capitalization is the corollary of investigation and provides the means whereby the results prophesied in the preliminary work are to be attained. It should take into account the arranging and the getting together of the required capital and capital resources, which in turn implies a reconsideration of the plant and machinery desired. These points are to be considered: (a) The methods of operation; (b) the mechanical plant; (c) the capital involved reaching the market and (d) the financial plans.

Organization is the product of investigation and capitalization and provides the medium through which the suppositions of the first allied to the provisions of the second become translated into active operation. It includes: (a) Management and administration; (b) the provision and retention of labor; (c) the proper use of the capital; (d) the relations of the mine to the market and the country, and (e) future expansion.

Recollections of a Manager

Following most mine explosions, especially those due to gas, the State Mine Inspector's department is able to call attention to the fact that they were undoubtedly caused by lack of judgment on the part of one of the men who lost their lives. Twice during the years that I had charge of mines as superintendent it fell to my lot to accept such a report from the state inspector.

The first explosion was not a very serious one and failed to make much of an impression upon me; but after the second I decided that it was up to me to find out whether such disasters were preventable.

I was able to get full data covering a number of explosions that were unquestionably caused by gas, and from a reading of these reports I became firmly convinced that open lights in gaseous seams were at the bottom of most of them. I immediately decided to prohibit the use of open lights in the mines under my jurisdiction.

Right there, however, I learned that superintendents do not always possess supreme authority. My mine foremen protested against the order, insisting that we would lose most of our miners. When at last I succeeded in convincing them that I was in earnest, and would not reconsider, the miners' union took matters in hand and refused absolutely to allow me to create rules for the guidance of miners unless such rules were required by the mining laws of the state. I discussed the matter with the superintendents of adjoining mines, but found that they were divided in their opinions as to the necessity of prohibiting open lights in mines known to generate gas; and they would not join me in open battle with the union officials. Finally, I was compelled to lower my flag and float with the stream, trusting to my inspectors and to Providence. Shortly thereafter I was called to the manager's chair.

A superintendent is able to go to the pit mouth any morning before the men go to work and interview each fireboss as he comes from the inside; he does that whenever he feels uneasy for any reason, and he is said that mining officials are victims of premonitions, as are all other human beings. But a mine manager is of necessity so far from the scene of operations that he must depend entirely upon the reports of his subordinates and seldom meets them face to face. The superintendent can trust to Providence yet keep his eye on his men, but the manager has only Providence to lean on.

Two explosions following one another in rapid succession, both occurring on holidays, came up for discussion just after my promotion. One occurred on Thanksgiving Day and the other on the following Sunday. Neither happened at one of our mines, but either might have happened there. In each instance a fireboss took chances with some of the working places, because he knew that the men would not go to work in them on that particular day. At one mine the fireboss got out in time to attend a picnic, which he enjoyed very much; but certainly he will never enjoy another picnic if he lives to be one hundred. The other fireboss lost his life with the 20 men who went to work that day.

I spent the following week devising rules to apply to inspections made on idle days, and especially days when repair men had work to do on the inside. Afterward I destroyed them all and wrote a circular letter to all the superintendents, warning them against placing too much confidence in rules. Personal contact is the thing, I said.

My surrender to the mercies of Providence and the open lights was now complete.

How Illinois Miners Used To Load Their Mine Cars—The largest lumps of coal were loaded into the car by hand. The remainder was raked onto an iron or wooden plate or pan and thus transferred to the car, all the fine coal and dirt not gathered by the rake being left in the mine. According to W. L. Morgan, the pan was usually a hand scoop made of sheet wrought iron or steel, the front end being open, the sides generally approaching each other toward the rear of the pan and being curved upward. These sides were provided with handles for lifting and carrying the scoop. The dimensions of the pan were varied to suit conditions. The purpose of the appliance was to provide that only clean lump coal be deposited in the pit box or car, and the end was attained whether the coal was loaded onto the pan by hand or scraped onto it by a rake or fork. In some parts a penalty was imposed on any person who was found loading coal with a shovel.—E. A. Holbrook in "Dry Preparation of Bituminous Coal at Illinois Mines," University of Illinois Bulletin No. 88.

Testing Mine Rescue Apparatus*

By C. E. PETTIBONE†

SYNOPSIS—The author advocates a test of breathing apparatus by which parts of the apparatus are plugged and subjected to an internal pressure of 5 oz. Should this pressure, which is twice the maximum experienced in use in any part of the apparatus be retained without noticeable decline for one minute, the apparatus is regarded as sufficiently tight against any inleakage of dangerous gas in a poisonous atmosphere.

This paper describes some experiments that we have been conducting on the testing of mine rescue apparatus for Pickands, Mather & Co. I am desirous of obtaining a general expression as to the practicability of the test here described.

This test has been applied to the Draeger apparatus, which is the type of apparatus we are using. We believe, however, that the principles of this test can be applied to any type of rescue apparatus, it being only necessary to develop a few connections and make other unimportant modifications.

Many articles and much discussion have been devoted to setting forth the dangers that might arise and have arisen from leaks in breathing apparatus. Any consideration of the merits of different types of these apparatus has always brought up the question of negative pressure, or suction, and of the amount of the apparatus which is under such pressure.

In order to satisfy ourselves that leaks in the apparatus are important, we tried the following experiment with an apparatus not of the positive-pressure design. We sent several men into a smokeroom filled with formaldehyde

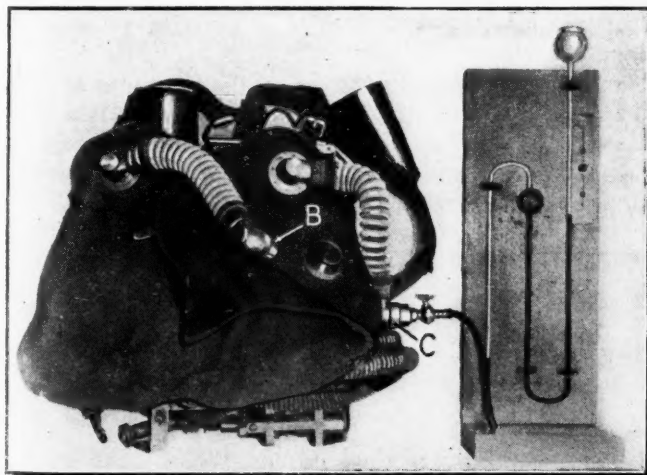


FIG. 1. TESTING THE WHOLE APPARATUS FOR LEAKS

fumes. All the men had good cartridges in their apparatus. They were told to come out as soon as they recognized the odor of the formaldehyde vapors. None of them had any trouble with his apparatus, and the men were called out.

*Abstract of a paper read before the Mining Section of the National Safety Council, Oct. 20, 1916. The experiments described were conducted by H. L. Scheiber, Palatka, Mich.

†Director, Department of Safety, Welfare and Insurance, Pickands, Mather & Co., Cleveland, Ohio.

A cartridge with a small hole was then inserted in the apparatus worn by one of the men, but none knew which man had the defective cartridge. In a short time the man with the punctured regenerator was obliged to retire. This test was tried several times, and in each case the man with the defective cartridge was unable to remain in the formaldehyde fumes.

A similar operation was tried with the Fleuss apparatus, a hole being cut in the inhalation tube that connects the breathing bag with the mouth-piece. Similar results were obtained. There was therefore convincing evidence that leaks in the apparatus would prove very serious, if not fatal, when operating in poisonous gases such as carbon monoxide. It was probably because of criticism of this character that the Draeger Oxygen Apparatus Co., several years ago, changed its apparatus to what is known as the positive-pressure type, in which a greater portion of the apparatus in use is placed under positive pressure. The ordinary tests, made with the liter bag and gauze, show only that the reducing valve and injector are furnishing the desired quantity of oxygen and are producing the required positive and negative pressures necessary to maintain the circulation of air through the apparatus. Neither of these tests will indicate leaks. We established this fact by testing the apparatus with the punctured potash cartridge mentioned previously.

The "smokehouse test," which consists in wearing the apparatus in smoke or formaldehyde fumes, will not indicate leaks in parts of the apparatus that are under positive pressure, and it is questionable whether minor leaks in those parts that are under negative pressure would be discovered. Of course leaks of this latter type, if not determined in the smokeroom, would probably not be dangerous in the actual use of the apparatus, unless they become larger. But danger lies in the fact that such minor leaks would, in all probability, become larger and more serious while the apparatus was being worn in actual mine rescue work.

It was therefore felt that some more definite method of determining leaks was desirable. At first we used different kinds of rubber plugs, and made other provisions by which we were able to blank off the open ends of the apparatus. Then, by admitting oxygen from the cylinder, the entire apparatus could be put under pressure. The apparatus was then immersed in water, care being taken to keep the finimeter above the surface.

Many leaks that could not otherwise be determined were thus made apparent. But there were several objections to this manner of procedure. First, the pressure put on the apparatus was not known; consequently, it was not determined whether the apparatus was being overstrained; second, the constant immersing of the apparatus in water is unquestionably not beneficial.

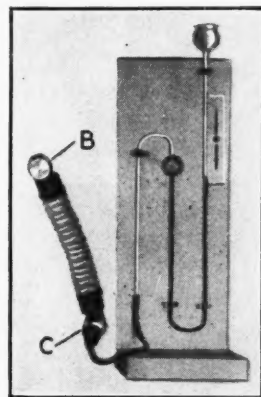
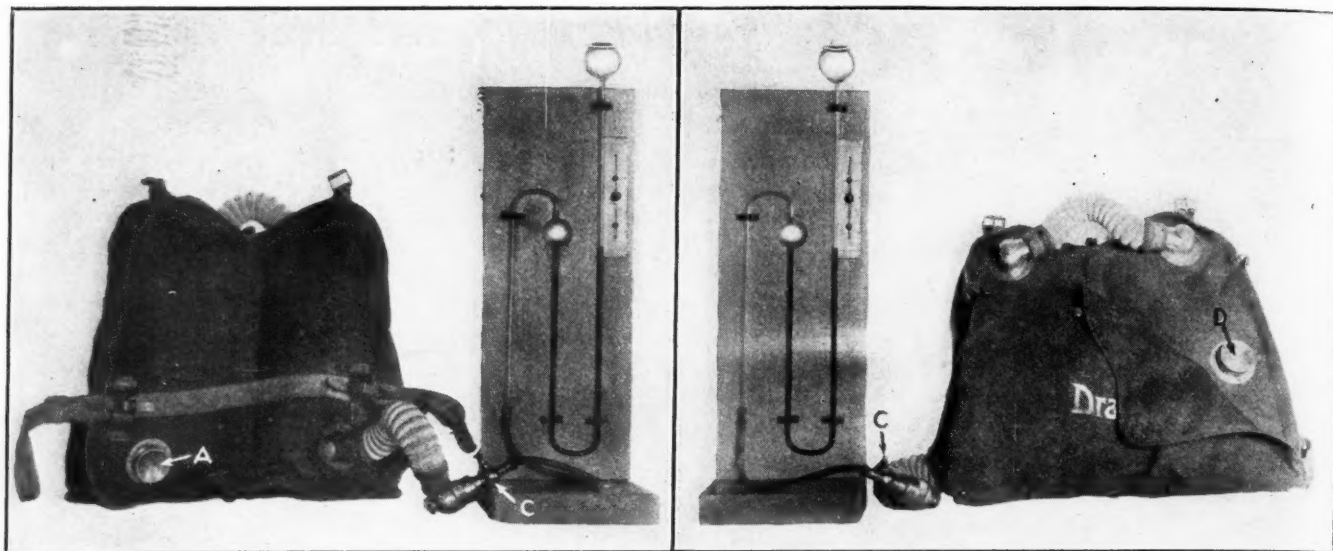


FIG. 2. PROVING THE FLEXIBLE TUBES



FIGS. 3 AND 4. U-TUBE IS ATTACHED TO THE BREATHING BAG AS SHOWN

Later, we were able to obtain from the Draeger company three testing parts by which the various connections could be blinded and whereby proper connection could be made to a pressure gage. These parts are lettered *A*, *B* and *C* in the various illustrations. We endeavored at that time to induce this company to make a cap for the relief valve of the bag, but it objected to doing this on the ground that some one might wear the apparatus with the cap in place over the relief valve.

We made two types of blanks for this valve, one which fits tightly over the valve and the other made by soldering up the relief valve of an old bag. The former blank is preferable, as it can be used without removing the relief valve. In the illustrations this valve is marked *D*. The Draeger company is now furnishing a blank for this purpose.

In all discussions, and in talking with sales agents of the various apparatus, I have never seen or heard of any figures that give the pressures actually existing in the different parts of the apparatus under normal operating conditions.

We developed a water U-tube, as shown in the various illustrations. This was graduated for the reading of pressures in tenths of ounces. By soldering a pipe in the

side of a potash cartridge near the base, and by other connections, we were able to tap in on the circulation and obtain the pressures existing under normal operation at five different points in the apparatus. The following results are the average of tests of several apparatus with different men wearing them, and with the breathing bag set to release at $+2\frac{1}{4}$ oz.:

| Test No. | U-Tube Attached to | During | Minimum Pressure in Ounces |
|----------|--|------------|----------------------------------|
| 1 | Inhalation tube between bag and mouthpiece | Inhalation | $\frac{1}{2}$ |
| | | Exhalation | 1 to $2\frac{1}{4}$ |
| 2 | Exhalation tube between bag and mouthpiece | Inhalation | $\frac{1}{2}$ |
| | | Exhalation | $1\frac{1}{2}$ to $2\frac{1}{4}$ |
| 3 | Inhalation tube below bag | Inhalation | $\frac{1}{2}$ |
| | | Exhalation | $1\frac{1}{2}$ to $2\frac{1}{4}$ |
| 4 | Exhalation pipe below bag | Inhalation | $\frac{1}{2}$ |
| | | Exhalation | $\frac{1}{2}$ to 2 |
| 5 | Bottom of potash cartridge | Inhalation | $\frac{1}{2}$ |
| | | Exhalation | $1\frac{1}{2}$ to $2\frac{1}{4}$ |

It will be understood that the pressure as measured is positive, except in the exhalation pipe below the bag during inhalation, where it is a negative pressure as indicated.

Thus the maximum pressures in the apparatus are $2\frac{1}{2}$ oz. in back parts and $2\frac{1}{4}$ oz. in front parts. When the bag releases at $2\frac{1}{4}$ oz. in front, $2\frac{1}{2}$ oz. are recorded in the back parts. This pressure is about what can be obtained by inflation with the lungs.

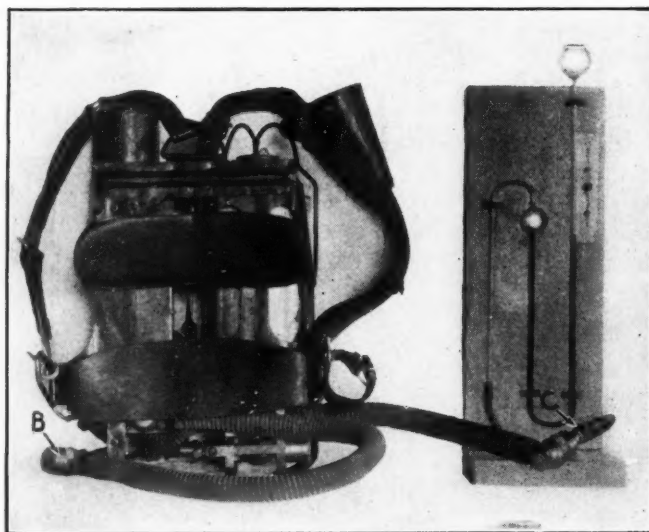


FIG. 5. TESTING ENTIRE BACK OF APPARATUS

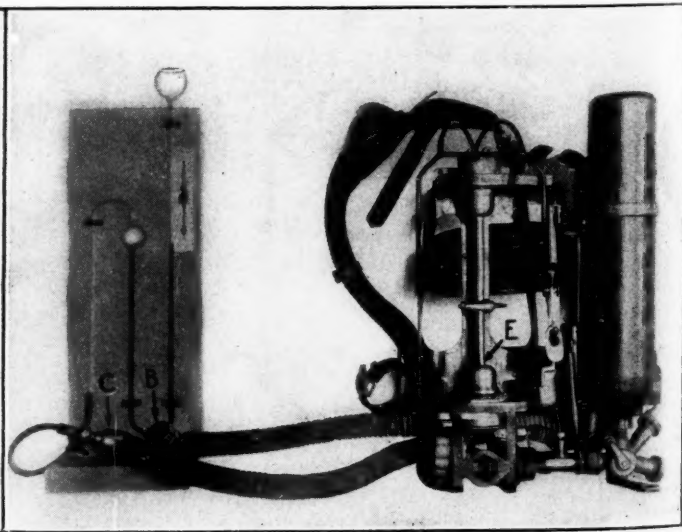


FIG. 6. PROVING TIGHTNESS OF BOTTOM PARTS

After determining the maximum pressure under which the apparatus operated—namely, $2\frac{1}{2}$ oz.—we decided to test it with 100 per cent. overload—namely, at 5 oz. of pressure. We found it was impossible to make the apparatus so tight that the water in the U-tube would permanently remain at 5 oz. This was due unquestionably to infinitesimal leaks in the fabric and valves.

We found, moreover, that if the smallest possible pin-hole was made in the potash cartridge, the pressure would be relieved and the water drop in not longer than one-half minute. We therefore decided that the apparatus should be considered as being in good condition when under a pressure of 5 oz., if the water did not fall in less time than one minute.

In operation, the U-tube is filled with water to a point just below the reservoir, and the scale is adjusted so that zero on the scale corresponds to the height of the water. Care must be taken to make sure that there are no bubbles of air in the column.

The tests are as follows: Test 1—Connect the entire apparatus as shown in Fig. 1. Blank off one tube at the

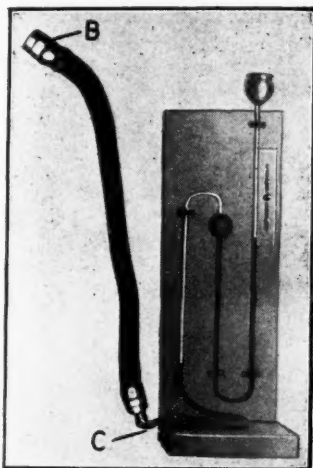


FIG. 7. PROVING CIRCULATION PIPES

top of the bag with the test plug *B*. Connect the other tube to the stop-cock *C* of the testing set and attach this to the U-tube. Plug up the release valve with the plug *D*. Admit oxygen very slowly from the cylinder until a pressure of 5 oz. is obtained. Shut off the oxygen. If the apparatus is free from leaks, the water will remain at this level or descend very slowly, taking longer than one minute to descend. If the test shows leaks in the apparatus, they may be located by testing portions of the apparatus as follows, but whenever a leak is located and corrected the entire apparatus should be connected up and retested.

Test 2—Test the flexible tubes as shown in Fig. 2. Test 3—Using tubes tested in test 2, test the bag as shown in Figs. 3 and 4. In tests 2 and 3 inflation can be obtained from the lungs or a small pump. Test 4—Test the entire back of the apparatus as shown in Fig. 5.

If a leak is indicated, it is advisable to remove the potash cartridge and insert the cartridge plug *E*, shown in Fig. 6. It consists of two bell-shaped cups connected by a pipe fitted with a stop-cock. While the valves at the top and bottom of the potash cartridges are shut when the cartridge is removed, they do not close tight enough for this test.

Test 5—Test both circulation pipes, as shown in Fig. 7.

Test 6—Using tested circulation pipes, test the bottom parts by closing the stop-cock in the cartridge plug described above, as shown in Fig. 6. Test 7—Test the entire back parts with the stop-cock in the cartridge plug open, using tested circulation pipes.

When a leak has been localized, it can usually be found by feeling with a damp finger. If not, the part may be immersed in water. The foregoing tests of the apparatus if made monthly, will maintain it in excellent condition. In case of actual rescue work, the testing of the entire

apparatus, as described, consumes only a few minutes; and if desired, the usual pressure test of the reducing valve and the injector can be obtained from the U-tube. Of course, the smokehouse test can be employed in addition to those just described.

David Ross

The coal-mining industry throughout the West and East will regret to learn of the untimely death of David Ross, which occurred Oct. 23, 1916, at his home in Springfield, Ill. The cause of death was apoplexy and hemorrhage of the brain.

David Ross was born near Edinburgh, Scotland, Sept. 19, 1861. He came to this country in 1868, with his parents, who located for a short time in Salt Lake City, Utah, but later found a permanent home in Illinois, where Mr. Ross, then a boy, afterward worked as a miner



DAVID ROSS

Former secretary of the Illinois Bureau of Labor Statistics

for a number of years, in the longwall mines of the northern Illinois coal field. While still employed in coal mining, Mr. Ross continued to study in his spare hours and was considered one of the best posted men in general affairs in his community. It was not long, however, before Dave's ambition took him out of the mines and started him reading law in the office of Robert McDonald, at La Salle, Ill. With such avidity did he follow this bent of his mind that he was successful in passing the examination and was admitted to the bar in 1889, from which time he continued to practice his profession in that city and to take an active part in its civic welfare, until his election as a member of the 36th General Assembly of the State of Illinois.

As a legislator, probably no man has ever served his constituency with greater fidelity and honesty of purpose. Mr. Ross always kept uppermost in his mind the interest of his fellow workers in the mines and elsewhere. He was largely instrumental in the enactment of many good state laws, particularly those relating to coal mining.

Following his legislative term, Mr. Ross was engaged for a short time in the Southern states, as internal revenue inspector, returning later to his practice of law at La Salle, Ill. In 1897 Governor Tanner appointed David Ross secretary of the Bureau of Labor Statistics, which office he continued to hold during the Yates and Deneen administrations. It was while Mr. Ross was secretary of this important branch of the state service that he had many opportunities to work for the betterment of the coal-mining industry in his state.

It was largely through his efforts that the coal-mining laws of Illinois were amended, and the state mining board made more efficient and the mine inspection service increased. During this time free employment agencies were established in the larger cities of the state, and the system of factory inspection was put into force and extended. To Mr. Ross' efforts must be attributed much of the credit for the enactment of the Illinois Child Labor Law, which is a model of its kind. Later, the Workmen's Compensation Law in the state found a very staunch friend and supporter in David Ross. It is the belief of many that he did more to bring about the passage of this law than any other man in the state. While others may claim the credit, the fact remains that David Ross did much of the real work.

Following the advent of the Democratic state administration, Mr. Ross sought and obtained employment with the Aetna Life Insurance Co., of Hartford, Conn., and was in their employ at the time of his death. His knowledge of mining conditions in relation to compensation laws made his services valuable to the insurance company that employed him.

At his request, Mr. Ross had been granted a brief vacation to assist in the recent political campaign in his home state, and his activities in that line brought on the trouble that caused his death. He was laid to rest in the home cemetery at Springfield, Ill., by the members of St. Paul's Lodge, A. F. & A. M., of which he had long been a member. The pallbearers were James J. Hulen, James Taylor, Thomas Hudson, David McCrindle, Thomas Moses and Duncan McDonald. Mr. Ross is survived by his widow, one daughter, and a son.

David Ross was a self-made man, having started to work in the mines at 10 years of age and rising, by his industry and energy, to positions of influence and honor. He considered all men his friends and was loved and trusted by those who knew him. His generosity has often helped men less fortunate than himself along life's rough and rugged road. No one who appealed to him for assistance was ever turned away. It can be truthfully said that David Ross loved his home, his fellowmen and his country, and that the coal-mining industry has lost from its circle a noble character and faithful worker.

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In British Mining Parlance the Word "Journey" is equivalent to what we term a "trip of cars." A recent article speaks of a "journey of cars traveling at 6 mi. per hr." The words "trip" and "journey" are synonyms in their ordinary meaning and the interesting problem is how either of them ever came to be used instead of "train"—a preferable word.

Neil Robinson

On Saturday morning, Nov. 11, by the death of Neil Robinson, the coal industry suffered an incalculable loss. A more widely known authority on coal than Mr. Robinson would be hard to find.

Mr. Robinson was born in Gallipolis, Ohio, in the year 1853, and early in life settled in West Virginia. His first official connection with the coal business was that of general manager of the Stuart M. Buck Coal Co., a mine shipping coal in barges on the Kanawha River, which position he held for some time, later purchasing the company and forming the Robinson Coal Co., which he operated for a number of years. By strict application to the coal business he acquired a fund of knowledge that soon gained for him the reputation of being an authority on the subject.

A widely known publication by Mr. Robinson is "The Coal Fields of the Kanawha." This is recognized as an



THE LATE NEIL ROBINSON

authority on coal and is not only a reference book for coal men, but is found in the libraries of banks and bonding houses.

Many of the important financial concerns of the country have at some time been included in Mr. Robinson's clientele. His reputation was so far-reaching that he was consulted at every large financial center.

It is doubtful if, during the life of Mr. Robinson, a coal operator in southern West Virginia would open a new mine without consulting with him. He was considered one of the authorities on the Appalachian measures.

Mr. Robinson's last official connection was that of president of the La Follette Coal and Iron Co., La Follette, Tenn. On Dec. 23, 1913, he was appointed by Judge Sanford of the Federal Court for the Eastern District of Tennessee, as receiver of the property of the La Follette Coal, Iron and Railway Co. His successful operation of this property for two years resulted in the reorganization of the company under the title of the La

Follette Coal and Iron Co., of which he was made president. He held this position at the time of his death.

Other positions of honor held by Mr. Robinson were: President of the Citizens National Bank of Charleston, W. Va.; secretary of the West Virginia Mining Association, and president of the West Virginia Mining Institute. In the two latter associations he represented the operators in many rate cases before the Interstate Commerce Commission and was instrumental in bringing about a number of safety measures beneficial to the operators and the employees.

He stood high in Masonic circles, being the first Potentate of the Beni Kedim Temple and Past Grand Master of the Grand Lodge of West Virginia.

In November, 1914, Mr. Robinson's heart showed signs of weakness, and from that time until his death his health gradually grew worse. Up to within a few weeks of his death he kept in touch with his work and carried it on successfully.

He was a man of simple tastes and commanded the love and respect of his fellow-workers. His rule was one of love, and the efficient results he obtained from his subordinates was due to their desire to show him the love they had for him. At his funeral strong men shed tears freely, so great was their grief at his death. The legacy he leaves is an inspiration to emulate his character and pattern after his works. His genial and generous disposition will long be kept in memory by his associates.

Closing Sessions of American Mining Congress

SYNOPSIS—The American Mining Congress discussed the closed shop at much length. Its interest in freight rates is apparently on the wane, and coöperation seems to be its immediate object, judging from the number of papers bearing on that subject.

Reference has already been made to E. N. Hurley's address on the "Federal Trade Commission and the Mining Industry," which appears in extensive abstract in this issue. The paper was read at the Wednesday morning meeting, Nov. 15, which was a general session for the Coal, Metalliferous, Oil and Gas, Uniform Mining Legislation and Public Land Sections.

At this meeting Glen W. Traer, of Chicago, read an excellent address on "Industrial Coöperation Under the Sherman Law," in which he declared that "the Federal Trade Commission Act strongly resembles an attempt to give the appearance of something without giving the substance. . . . No initiative power is conferred on the commission except to prevent the use of unfair methods in competition. . . . I urge you that you again assert that it is the deliberate judgment of your organization that arrangements among producers and distributors shall not be declared unlawful, unless the purpose or the necessary result shall be harmful to the public interest or shall give either buyer or seller an arbitrary advantage; also that the Trade Commission shall be vested with power to pass upon the propriety of such arrangements, with power in the courts to reverse the finding of the commission, but that no person or corporation shall be liable to criminal prosecution or civil damages while acting within the scope of an order of the commission."

On Tuesday night, Nov. 14, the uniform legislation section held a session in which Judge I. W. Thompson, of the United States Bureau of Mines, made "Suggestions Regarding Unifying State Laws."

In his plea for uniform legislation he urged that while conditions were diverse in the different states and the occurrence of mineral not uniform, this was also true of any one state. He made this aphoristic statement: "Mineral deposits in their making were indifferent to state lines; and likewise they had as little regard for the

lines bounding the subdivisions of a state. There may be as great a diversity of deposits in a single state as in the entire United States."

He added that the demand for a single national law of mining would end in a fruitless agitation until some person or body is delegated to prepare the contemplated law. Some person or committee must be appointed to 'bell the cat.'

R. W. Ropiequet then steered back to an old forgotten channel of the congress long since silted to the very banks. He read a paper on "Coal Freight Rates—Relativity and Uniformity." No one else had anything to say about the freight-rate battle. In fact, perhaps, it were better that everyone forgot it and put up with the ancient rates, unjust as they are, because adjustments might be still more unjust. But do not think that Ropiequet did not say some interesting things, for he did, one of which follows:

The opening and development of new coal fields under the fostering care of carriers through favored or special freight rates regardless of the actual or relative cost of transportation long before the condition of other existing coal fields already fully developed rendered the opening of these new fields advisable, is the one outstanding crime against the industry.

But Ropiequet is not a radical, for he adds:

Under long-existing relative rate adjustments, investments have been made and business been so established that the immediate application of true principles of transportation thereto and the adjustment of coal rates in conformity therewith would simply result in "confusion worse confounded" and produce conditions so chaotic that they would in many cases be practically destructive of the industry. . . . If a change is to be made, it must be made gradually.

On Wednesday afternoon the coal section of the congress held an extremely interesting meeting.

The address of Dorset Carter, of Oklahoma City, Okla., on "The Closed Shop and the Check-off as Related to Efficiency," which was read for him in his absence, was followed by an animated discussion. Carl Scholz declared that the coal-mining industry was the only business under the sun that collected a munition fund with the proceeds of which the members of the union could wage war upon the industry.

The operators have made these collections so long that they hardly realize the significance of what they are doing. The collection now seems such a natural thing that we could as readily imagine ourselves as ceasing

to breathe as conceive of operating a mine without a check-off. But because the industry does not realize the unjustness of the proceeding does not detract a whit from its viciousness.

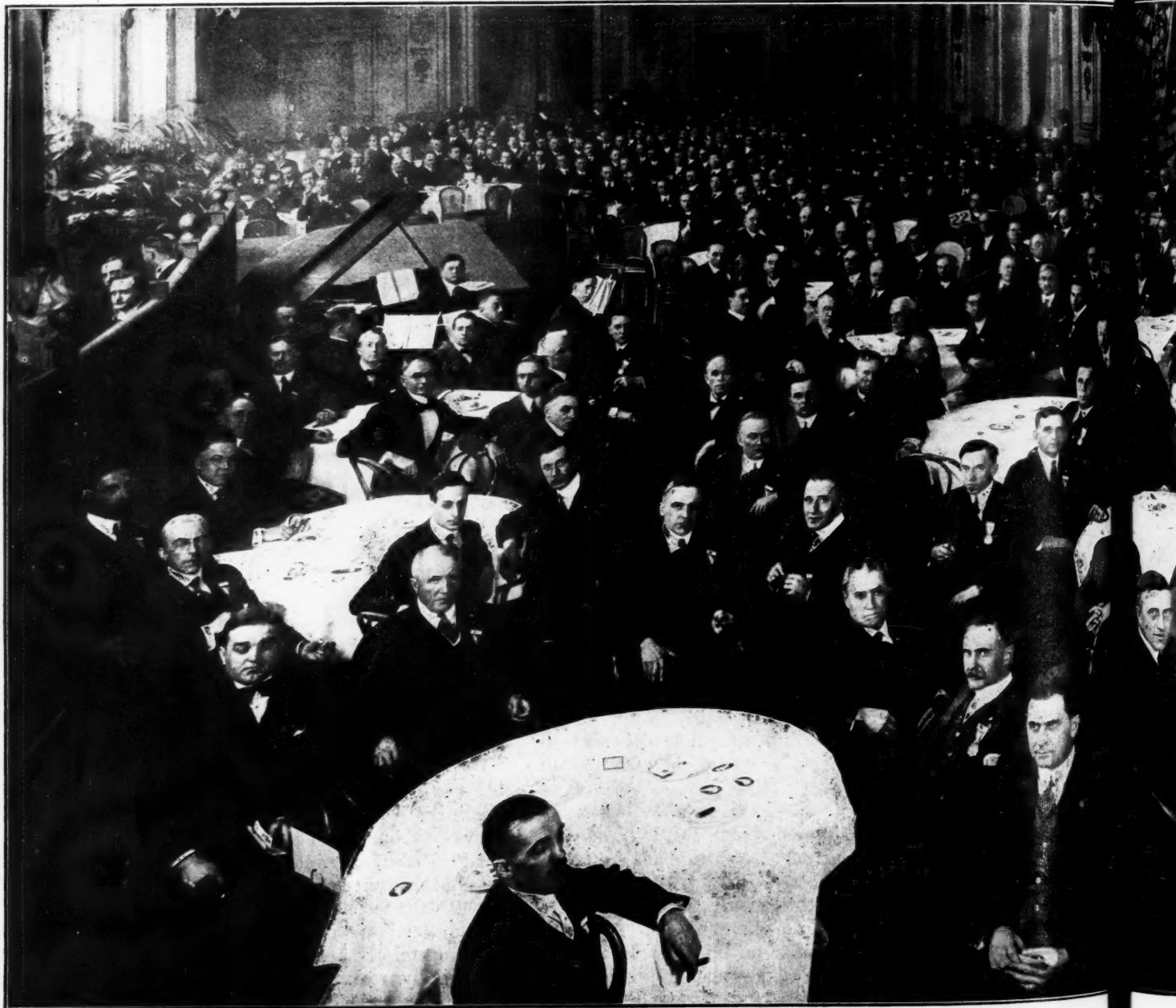
The union depends for its life on the dues secured through the operators. Without these it would die. It is not dependent for its life on services rendered to the members, but on the pressure which the operator is compelled to use to make members continue their membership and pay their dues. The mine worker must pay his dues whether he desires so to do or not. Moreover, the check-off is disastrous because the miner who has paid money month after month to an organization demands something for his money. He has paid for agitation and strikes and he needs must have both. He is not happy till he gets them. The mine worker, having paid for the show keeps clamoring for action, and as a result the check-off has been a source of continued turmoil.

Mr. Scholz said the men pay about \$30 per capita to the union. This figure was obtained from a compilation

made last year, by Mr. Scholz, in which he used data procured from a number of the leading companies in all the states where the check-off is collected. T. H. O'Brien, general manager of the Stag Cañon Fuel Co., said that the check-off was not in force anywhere in the West.

J. K. Dering, president of the J. K. Dering Coal Co., then discussed the situation at the mines of the Vandalia Coal Co. This company had a mine that it considered more than usually dangerous, and to obviate the dangers it proposed to put electric safety cap lamps into use at that operation.

The inspectors of Indiana approved the use of the lamps. The Industrial Board of the state not only approved them, but also declared that if the men refused to use them they and their dependents would have no claim for compensation should they be injured or killed. But in spite of these facts the mine workers went on strike, and after some weeks of contention the men in the mines for some miles around went out in sympathy with them.



MEMBERS OF AMERICAN MINING CONGRESS IN

In accordance with the rules of the national organization, Mr. White would not interfere. He said he could not do so till the strike was state-wide. So, though to leave open lights in the mine would have resulted in practical manslaughter, the operator could not eliminate them, owing to the opposition of the local officials and to the impotence of the international officers of the union.

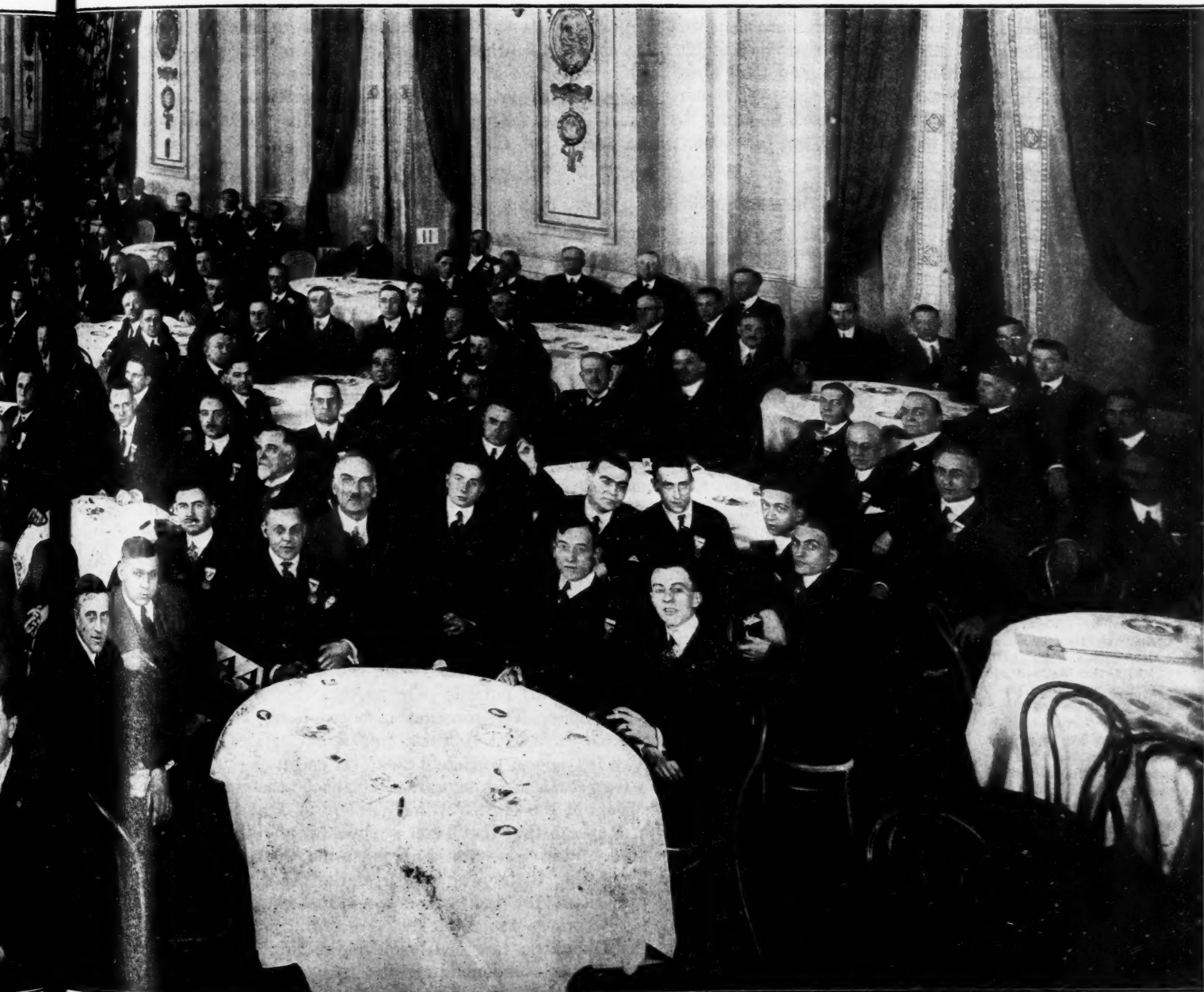
But such an extensive strike demanded money for its continuance, and the mine workers sought to meet the need by requiring the companies to check off a large sum of money from the wages of each employee. The other operating corporations were thus drawn into assisting the mine workers to fight a neighboring corporation, the purpose being to compel that company to violate the rules of safety. The companies of Indiana were, of course, strongly opposed to such a course, but the miners threatened a strike if the additional check-off was not granted.

W. J. Snyder added that the amount of special check-off demanded to maintain the Vandalia strike was 50¢.

per week, or \$2 per month, in addition to the regular check-off. He said that in general the mine worker does not desire safety. Carl Scholz then related an experience at the Melcher mine:

I was visiting one of the working places in the mine accompanied by one of our superintendents, the mine foreman and the district mine inspector, and found a miner had been piling his slack behind him for quite a distance from the face. We had to crawl over the pile to get to him. He was found pouring powder in his shothole by means of a charger, which is a hollow cylinder with the top partly open into which the powder is poured from a keg. He was loading up his charger with a carbide lamp on his head.

Naturally, I was horrified at his carelessness, and I grabbed his lamp and took it out of his cap and said: "For goodness' sake, don't run such risks. If you don't want to protect yourself, quit such dangerous practices for my sake. I don't want to be burned to death in this hole." The man looked at me with painful surprise and said, "What's it to you?" I told him that I was an official of the company making an inspection of the mine and that what he was doing violated the company's rules. I explained that he would have to do as these rules required. He made some unpleasant remarks, but finally decided to overlook my interference and continued his work.



ATTENDANCE AT A "SMOKER," HOTEL LA SALLE, CHICAGO, NOV. 21

When he had the powder loaded he proceeded to fill up the hole with coal-dust tamping. I told him to stop, and assured him that if he put any more coal dust in that hole he would be fired. His reply was, "If I'm discharged, out goes the whole works." My reply was, "All right, out you go, any way." I insisted on his being discharged, but the mine foreman interceded for him, and upon his promise not to violate the company's laws again he was reinstated. His entire position was based on the idea that his local organization supported him, and that the check-off would protect him from the results that should follow his violation of the rules of safety.

On being asked by J. K. Dering how long the mines would have to lie idle before the miners would consent to the revocation of the check-off in future contracts, Carl Scholz replied that it would be as easy to foretell whether snow would fall on Dec. 25. Mr. Scholz said that he had had 15 years' experience with organized and 10 with unorganized mine labor, and had made it a point to keep in close contact with his mine workers. He found as a result that a large number of the miners were opposed to the check-off.

The mine workers, however, if lined up in a row, will not answer the question in the same way if interrogated by their own officials. There is a big difference between the answer obtained by the operator and the union official. Mr. Scholz said that the Rock Island Coal Co.'s officials asked the miners if they would strike over clause 4 in the agreement if the company refused to grant it. The mine workers declared that they did not care about the clause, but they struck nevertheless.

WOULD RATHER INJURE UNION THAN BE A "SCAB"

When the time came no one wanted to be called a "scab." A man would sooner sacrifice his home than be given that name, even if he does not believe in the cause for which the others are striking. He will move into Colorado and he will work in that or any other nonunion state which is supplying coal to a territory that would otherwise be supplied by union labor, but he will not be a "scab" in union territory. There may not be much of a desire for the check-off; many men may not want it, but they will stay out on strike for a long while to maintain it, because every man is afraid to even appear to weaken on what has become such a fundamental principle of coal-mine unionism wherever it has been established.

Senator John I. Clarkson dissented with Mr. Scholz. He said:

If we once admit that we want unionism—an organization of miners or of any other industrial workers—then the important question becomes how to obtain the most unified effort on their part. My practical experience is that without the check-off the organization could not be maintained.

It was my privilege and pleasure some 20 years ago, to act as an official of the miners' organization. We sought then to obtain memberships by voluntary contribution. There were a few who always paid. There were many, probably more then than now, who would not pay; not because they were opposed to the union or to the benefits which would accrue from its continued existence, but because they, like those in any other industry, were willing, too willing, to obtain and accept something for nothing. They were well satisfied to have some other fellow do the work, just as some of us are willing to come to Chicago and sit down and watch some of the officers of the American Mining Congress shoulder the burdens for us. Some men are quite content to accept the benefits of unionism irrespective of who may pay the price. And then there is a minority which would rather contribute to a keg of beer than to a mine workers' union.

Senator Clarkson then declared that he was the author of the law that the man in Mr. Scholz's mine was violating. He said that he had desired to have it provide that

the superintendent and mine foreman be given police power so that they could enforce the law. He could not get the operators to help him in inserting any such provision. He urged, however, that under the law as written the man could have been brought before a justice and fined. When he was told that a strike would have resulted, he said he thought that was possible, but he felt sure that the officials of the organization in Iowa would not support any such strike. He felt that the officers of district No. 13 recognized the sanctity of contracts.

In one case he recalled, they kept the miners at work though they knew the operator was violating the contract. They did not wish the mine workers in this or in any other case to be prosecutor, witnesses and judge. They realized that there was a proper and recognized way of correcting the abuse, and that way was not by a strike, but by conciliation. He urged that the mine workers and their officers do not yet realize the correct attitude to take when difficulties arise and that time must be given to bring them to a realization of that attitude. Their thinking is not so accurate as it should be. As for the man Mr. Scholz mentioned, Senator Clarkson excused him, holding that we all do ridiculous things every day. We dodge in and out among the automobiles on the street regardless of the warning whistle of the policeman and the dangers of that proceeding.

SENATOR CLARKSON READY TO EXCUSE ANYTHING

Senator Clarkson was in a benign mood and ready to excuse anything—breaches of contracts just written and violations of laws he had himself penned. All alike were peccadillos to be excused. The sin of blowing up 200 men in a mine explosion was benignly placed on a footing with dodging an automobile, which proves the senator an accomplished politician.

E. W. Parker, who presided, stated that since the date of signing the anthracite agreement over \$2,000,000 has been lost to the miners by button strikes. The tonnage of the anthracite region would have been 1,000,000 tons larger than it actually has been since that time, if it had not been for these days of idleness. The shortage of anthracite from which we are suffering would in that event not have occurred. Senator Clarkson's statement that the check-off was necessary to keep the union together was, Mr. Parker averred, not borne out by the experience of the anthracite region. The Temple Coal Co. had a strike at the Lackawanna mine for about six weeks; 600 men were affected. The sole grievance was the fact that half a dozen men, about 1 per cent., did not have and wear buttons showing that they had paid their union dues. The conciliation board heard the case and ordered them back to work, but led by the local president they for a long time refused to go back.

George H. Cushing said that one of the international officers of the United Mine Workers of America declared in a speech that it did not make a bit of difference what kind of law was passed if the mine workers succeeded in electing their own justices of the peace to enforce its provisions, for then there would be no convictions of mine workers under the law. According to Mr. Cushing, the Oklahoma law does require the mine foreman and mine superintendent to arrest a man who is found guilty of violating the mining law in a way that menaces safety. But as he understood it, no one has been able to secure

any convictions, even though the foremen and superintendents have carried out the law's instructions.

E. H. Weitzel, general manager of the Colorado Fuel and Iron Co., said that it seemed to him that the check-off is needed by the union, for without it the union would not get the mine workers' money. There was no check-off in Colorado, but he had it when he was at Bellaire, Ohio, during the Pennsylvania anthracite strike. He could remember how the boys came to the office and told him that the check-off only applied to the coal mined and not to the yardage. Another man who worked overtime did not see why it should apply to that extra work. Mr. Weitzel was of the opinion that if the payment of the union dues was left to the consent of the miner in each case, the check-off, especially the extra check-off, would dwindle down to a small amount. He added that it was his opinion that the life of the organization depends on the ability of the union to force a man to both join the organization and pay the dues it demands.

JOHN P. REESE EXPRESSES HIS VIEWS

John P. Reese, a former district president of the United Mine Workers of America, and now president of the Superior Coal Co., said that he had had experience in districts where there was a check-off and where there was none. He thought the check-off system was justified both from the standpoint of the miner and from the viewpoint of any operator who was willing to work with a closed shop. He said:

Whenever I want to attack the check-off system I will attack the union. If I am going to do business with the miners' union I want the check-off. Both as a representative of the miners' union and as a representative of the organized coal operators, I experienced the evils and the blessings of the check-off system and of the union mine without the check-off. The check-off system is the least of two evils. All that any miners' local union needs today to get along without the check-off system when it is unionized is to establish the card system.

If you have an energetic, up-to-date pit committee operating the card system, you as an operator will petition the miners' union to give up the card system and take the check-off. Why? Because on Monday morning following pay day, or the day set for the mine workers to pay their dues, the pit committee will station itself near the top of the shaft or the entrance of the drift and exact a clearance card from each man before he is allowed to go in.

It is a simple proposition as it is worked in the block coal fields of Indiana. They have worked it there for years, and they do not want the check-off system. I don't know whether they have ever adopted the check-off in that field. They had not several years ago. At that time they had a compact, thoroughly closed shop.

For several years at the mines along the Kansas City track in southern Iowa, which is now a part of the Burlington system, the mine workers refused to adopt the check-off and kept the card system. The result was that every Monday morning following the Saturday dues-paying period a lot of the employees were chased home because they had either forgotten or failed to bring their cards. As a result the operators were willing and anxious to have the check-off system introduced.

Regarding the closed shop that goes with the check-off, it seems to me that if a coal operator is going to make an agreement with his employees he should have a closed shop. You can't hold the miners' union responsible for the acts of your employees if only a part of them belong to the miners' union. That is the argument that induced the operators with whom I did business as a miner to agree to the closed shop. They make a contract with the miners' union and they expect the miners' union to deliver under the contract.

True, they do not always do it, but they can and do come nearer doing it, where all the men belong to the union, than where only a part of the men recognize its authority. Of course, I realize that you could have an agreement with a miners' union and only a few men paying the dues, and that you would get along nicely in operating the mine, but like most open shops it would not be a union mine. The union

does not have any influence in an open shop. It may have something to do with formulating the original wage scale, but it has no influence in seeing that it is carried out or that the various provisions in the contract are interpreted to its liking.

The open-shop proposition simply means that the employer is running his own business. Whether he has a right to run his own business or not is another question, but if you are going to do business with the union, do business with it and hold the union responsible for the acts of its members. In the language of the miner, don't be a "sponger." You don't want the benefits of the Illinois Coal Operators Association, for instance, or of the Manufacturers' Association, without paying your dues to it.

Then, why should Bill Smith be allowed to get \$1.10 a ton for digging coal in 1916 in a mine where he used to dig it for 55c., without paying his dues to the union that got him that price. There is no defense for the man who wants to receive the benefits of government and yet will not pay his taxes. What do we think of the coal operator that refuses to affiliate with the association in his district? We do not call him a scab, but that is just what we think of him. And the miner does what we would do if we had the power. The miner says, "You don't get the benefits of our organization unless you pay for them." The operator would say the same thing, if he could, to the operator who does not belong to his association. If you do not believe that, just attend an operators' meeting.

I believe in the closed shop, and I believe in the check-off system, and as an operator I am confident that the check-off system is not an evil. When you talk about canceling the check-off system be fair with yourself. Whenever you get ready to take the check-off away from the miners be honest, and say that you are going to lick hell out of them and you're going to run your business to suit yourself.

HOW THE MINER EXCUSES DEMAND FOR CHECK-OFF

Why haven't the miners a right to inaugurate the card-day? Haven't the miners a right to refuse to work with any man they please? The courts have held that they have. And why should they not, for it is costing \$10 or perhaps \$20 a year, or even for a while—as in the Ohio instance of which my friend from Colorado speaks—10 per cent. of their gross earnings.

I paid it. I was getting \$75 a month from the miners' union and paid 10 per cent. of the gross amount to support the anthracite strike. Why shouldn't every man in that mine pay that same 10 per cent., just as every man in the nation must pay the same pro rata tax if the representatives in Congress agree that the tax must be paid. We all believe in representative government. Why should not the union have the rights which are always accorded to such government?

Some operators seriously object to collecting anything but the 50c. a month necessary to run the local union. I am willing to collect every cent that the miners will sign for. I say it is their money, and they earned it, and as long as they pay their honest debts let them assign the rest of it to their union if they want to.

Whether the open or the closed shop gives you the most efficient workmen is another proposition entirely. There are some advantages in running a union mine. Whether there are as many as in running a nonunion mine I do not know. I am inclined to think that you could develop individual efficiency more in a nonunion mine than you can in one that is controlled by the union. I know that there are many things that I could do in my mine if I did not have to consult anybody's wishes but my own.

If there were no mining law, I could get cheaper coal; but whether the way I would get it would be good for society or not is another proposition. My idea is that if we can in general keep honest men in official positions in the miners' union, then so far as humanity is concerned we are better off with the closed shop, and with the check-off, than we ever would be with the old system of the open shop, and the employer running his own business to suit himself. It is a fact, no matter how unpleasant it is to admit it, that there were few employers who knew how to run their businesses when they were allowed to run them to suit themselves.

J. K. Dering then pressed Mr. Reese to discover whether he would have backed the mine workers in their demand for extra assessments of 50c. per week when the object of the assessments was to compel the Vandalia Coal Co. to operate the Dugger mine with open lights. Mr. Reese first of all said that, if an unlimited check-off had been agreed on, the operators had no right to object to it no matter how large it was, provided that it was a

general assessment on all members alike and of a character in complete accord with the rules of the union.

Mr. Dering was not yet satisfied. He pointed out that the mine inspectors, the industrial board of the state and the international president of the union declared that the strike at the Dugger mine and the sympathy strike arising out of it were unjustifiable. He argued that an assessment to support an unauthorized and improper strike was itself unauthorized and improper and should not be levied.

Mr. Reese finally admitted that the facts as stated would have justified resistance and that the Vandalia Coal Co. did wrong in submitting to the injustice done it. Had the Vandalia and the operators of the "bituminous" district of Indiana (No. 13) resisted these unjust demands they would undoubtedly have succeeded in securing a just decision.

Mr. Reese then advocated compulsory arbitration for such cases. He recognized that you cannot compel any man to obey the verdict, but the moral effect is strong and is almost sure to be effective.

UNION ASSESSMENTS VIOLATE THE SHERMAN ACT

S. A. Taylor then asked how Mr. Reese justified the collection of 10 per cent. for the strikers in the anthracite region. Did it not conflict with the requirements of the Sherman Act? He desired to know if there was not in such actions a combination in restraint of trade. Mr. Reese replied that there was undoubtedly a violation of the Sherman Act, and "the difference between the miner and the operator under the act has been that the miner has been willing to take a chance and that the operator has not."

Mr. Taylor then said that the unlimited check-off made some men on pit committees anxious to secure for themselves a part of the large fund thus collected. In one case he had been troubled by a committee which claimed to be anxious to lodge complaints with the foreman and superintendent, but which was principally desirous of avoiding a meeting with those officials. The committeemen would dodge in at one opening and out at another to avoid an interview which might unfortunately resolve the grievance and thus end their day's work as mediators.

At one of these operations the pit committee served 17 days in one month. The property was well suited for their plans, for there were a number of small crop openings into the coal, and by watching the movements of the superintendent and mine foreman narrowly it was not necessary to meet them till it was too late to go back to work.

At another mine on every trifling occasion the committee would go to Pittsburgh by the trolley line to see the district president. He would always decide in favor of the operator, but the day's holiday was secured, and the purpose of the pit committee was attained. These cases resulted from excessive check-off funds. They were a source of impoverishment to the mine worker and a constant source of annoyance and loss to the operator. Some effort should be made to keep them within reason.

Then came E. W. Parker's paper. He is always equal to the occasion, because he puts a new light on the old tales of mining men so that they look cheerily new. Ideals so carelessly handled by other speakers that they lop and fall over, he balances neatly so that they look

entirely feasible. We are unwilling to quarrel with him about the Interstate Commerce Commission for which he has, strange to say, a word of praise. If E. N. Hurley's new board is a bloodless thing, like the Commerce Commission, which never denounces but quietly strangles its victim, then surely no one in the coal industry wants it. A commission that keeps rates uniform while wages rise is not a thing to tie to nor a thing to praise. It is because we think the Federal Trade Commission is of blood and of bones like to ourselves that we welcome its coming as the dawn of a new day.

The presidency leaves the capable hands of Carl Scholz after three years of active and aggressive service. The mantle falls on Walter Douglas, vice-president of Phelps, Dodge & Co., which has many western mining subsidiaries, including the Stag Cañon Fuel Co., with mines at Dawson, N. M. Two coal-mining men have been appointed to fill vacancies on the Board of Directors—W. J. Richards, of Pottsville, Penn., president of the Philadelphia & Reading Coal and Iron Co., and M. N. Kemmerer, of Whitney & Kemmerer, coal dealers, of New York City., and president of the Kemmerer Coal Co., at Kemmerer, Wyo. Irving T. Snyder, of Denver, and George H. Crosby, of Duluth, are two new directors to represent the metal-mining industry.

The 1917 meeting will probably be held at Birmingham, Ala. Invitations for the next meeting came from various cities, and while a decision as to the place of the next annual meeting is reserved, it is plain that a majority of the members of the congress are favorably disposed toward Birmingham. None of the nineteen annual conventions has been held in the South.

WOULD FORM NEW UNIFORM LAWS ASSOCIATION

A new organization was formed to promote the plan for uniform mining laws. The section considering uniform mining legislation, realizing that as a part of the American Mining Congress it might be regarded as being biased toward the operators, proposed to break away from the congress and form an organization to be known as the Uniform Mining Laws Association.

A. J. Moorshead, whose address on the commission plan of preparing legislation in Illinois appeared in last week's issue, and whose friendly attitude toward mine legislation generally is well known, was elected president. Robert Harlin, of Seattle, a member of the International Executive Board of the United Mine Workers of America, and a man of broad progressive qualities, was elected vice-president. J. G. Grossberg, a Chicago attorney, already a member of the Mining Investigation Commission of Illinois, was selected for secretary-treasurer.

It will be noticed that the organization did not give any place to metal-mining representatives. It was thought best to restrict the operations of the organization in the formation of a mining code to coal mining. The new association proposed that a commission be named to draw up a tentative code of uniform coal-mining laws. This commission was to consist of three coal miners to be appointed by the International Executive Board of the United Mine Workers, three coal operators to be named by the American Mining Congress and three members, none of whom should be identified or affiliated with the interests of either the coal mine workers or owners, and none of whom should be dependent upon the patronage or good will of either. These three mem-

bers were to be appointed by the Secretary of the Interior. The director of the Bureau of Mines was to be an ex-officio member of the commission.

The association requested the congress of the United States in a resolution to appropriate funds so that the United States Bureau of Mines might cooperate in this work. The American Mining Congress, however, refused to ratify the resolution which the uniform legislation section had presented. After several vain attempts to obtain acquiescence, Mr. Moorshead withdrew the resolution.

It is to be hoped that something will eventually come of this movement. Certainly uniform mining legislation is needed badly, and no rapid progress can be made so long as certain sections of the country are allowed to lag grievously behind and gamble safety for cheap cost of coal. No movement yet made has seemed more likely to receive the cooperation of miners and operators. A code produced by such a body would be well received, for no one would regard it as a tool for the furtherance of any special interest.

PROGRESS SHOULD MAKE TOWARD UNIFORM LAWS

It is probable that the American Mining Congress as a body can never profoundly modify the relations between capital and labor or promote a revision of the mining laws with the good will of the United Mine Workers of America, but it is possible that it could act as sponsor to an organization which could do those very things. In going to a nonunion district like Birmingham, in 1917, it is hardly likely that work such as was proposed in Chicago will be pushed to a satisfactory issue. However, Birmingham may not be the seat of the next congress.

The fact, however, that such progress was made and that it met with such a measure of success, shows that there is a large degree of charitable forbearance on both sides and much hope for a complete understanding. The mine workers thoroughly comprehend that the operator cannot afford to make his mines the last word in safety if his competitor is allowed to run his mines after principles which have been regarded as unsafe for twenty years.

Thomas L. Lewis, former president of the United Mine Workers of America and vice-president of that organization when John Mitchell was president, advocated that punishment, preferably imprisonment, be meted out to any one who endangered the lives of others or his own life in a mine. He pointed out that any individual who jeopardized the lives of others on the street was immediately put in custody and received no sympathy from the public. He contended that there was need for a stringency in the enforcement of mine laws such as was practiced in regard to those relating to street hazards. In order to carry his ideas in effect, Mr. Lewis submitted a resolution which was approved by the mining congress. This resolution provides that a committee of seven be appointed to investigate a practical way in which penalties may be imposed for violations of mine safety rules.

The division of the congress into sections enabled more to be accomplished than usual. This has been seen in the work of the uniform mining legislation section. By bringing together men who had a common aim, all the papers interested all those present, and the dominating idea was not allowed to be forgotten by the intrusion of matters not in accord with it.

There were a coal section, an oil and gas section, a metalliferous section and a public lands section. There is room, perhaps, for a freight-rate section and one dealing with equitable taxation. Safety and efficiency, the first and last watchwords of the American Mining Congress, encroach a little too closely on the National Safety Council, the American Institute of Mining Engineers and the Mining and Metallurgical Society. At these sessions little of technical character was presented, and the congress had enough to do without it. It might be as well to dispense with discussions on either safety or efficiency and to keep those two watchwords merely as beacons in the search for equitable business conditions and broad-minded national policies.

The congress held two social events of great interest. It had no outings and no visits to plants of any kind. It seemed to recognize that it was assembled to work and not for festal occasions. On Tuesday night a smoker was held at which more than 600 members attended. It was rendered delightful by its informality. The guests sang oldtime songs. Refreshments were served and singers in cabaret style added to the merriment of the evening.

At the banquet on Thursday night Carl Scholz made the address printed in last week's issue. Notable toasts were delivered by Col. George Pope, of Hartford, Conn., and Judge Frank H. Short, of Fresno, Calif.; the first speaking on "Organized Capital and Organized Labor and Their Relation to Efficiency, Conservation, Better Wages, Better Living Conditions, Lawlessness, Strike Disorders and Industrial Freedom," and the second speaking on "The Federal Government in Its Relation to the Public Lands of the West." George T. Buckingham, of Chicago, was toastmaster.

A TESTIMONIAL TO SCHOLZ'S ADMIRABLE WORK

Immediately on the assembling of the guests, Mr. Scholz, in turning over the direction of affairs to the toastmaster, announced the election of Walter Douglas as president of the congress. He had launched into his own farewell address when he was interrupted by E. W. Parker, of the Anthracite Bureau of Information. Mr. Parker began a discussion as to "time." He talked about spring time and its relation to winter time. He discussed the advantages of eastern time and central time. He compared the general conception of a good time with the time of adversity. As Mr. Parker's rambling talk continued, the perturbation of Mr. Scholz increased, as he knew nothing of what the committee had proposed to do. Finally he turned to Toastmaster Buckingham and asked if, by any chance, Mr. Parker had broken the rule of a lifetime and had indulged in intoxicants. His perplexity was short-lived, as Mr. Parker shortly concluded his dissertation on "time" by dangling a watch before the astonished eyes of the retiring president, saying that the time kept by the watch he held was declared to be as exact as human ingenuity could devise. The watch was a token of the esteem in which the members of the mining congress hold Mr. Scholz, who had been elected three times to the highest office at the disposal of the mining congress.

Colonel Pope, in his toast, dwelt on the kinship between mining and manufacturing. He pointed out that the mine operator often loses sight of the fact that the manufacturer is more than a consumer of the raw material he produces. He emphasized the fact that the manu-

facturer also bears a very important relationship to the mining industry, in that he perfects and makes machinery without which the operation of mines on any but a primitive scale would be impossible.

Judge Short based his talk on a parable, which in substance is as follows: "The Sam family was one of wealth. The father, Uncle Sam, divided the property equally between his sons, North, East, South and West. The portions which fell to the three older sons were awarded them and placed at their disposal at once. The youngest son, the West, received his portion of the estate so early in life that he was unable to take advantage of it. The North, East and South having had the full benefit of their part of the estate and realizing to the full how valuable it has been, suddenly recognize the great value of their brother's estate and come to the conclusion that his share should be taken charge of by all four heirs, so that the profit accruing from it would be divided equally among them." Judge Short, from this parable, developed a convincing argument in favor of the western idea of conservation.

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Winter Meeting of Kentucky Mining Institute

The winter meeting of the Kentucky Mining Institute will be held at the Seelbach Hotel, Louisville, Ky., Dec. 8 and 9, 1916. The tentative program is as follows:

On Friday afternoon at 2 o'clock, address of welcome by Hon. John Bunchmayer, mayor of Louisville, after which the following papers will be read: "Workmen's Compensation and Its Effect on Safety in Coal Mining," by E. C. Lee, chief inspector of The Associated Companies, Pittsburgh, Penn.; "Settlement for Mine Accidents Under New Kentucky Workmen's Compensation Law," by Robert T. Caldwell, chairman, Kentucky Workmen's Compensation Board; "Safety First at Kentucky Mines," round-table discussion by members of the Kentucky Mining Institute.

On Friday evening, at 7:30, the members of the Institute will be the guests of the Louisville Convention and Publicity League at a smoker in the Red Room of the hotel. Newell G. Alford, engineer of the St. Bernard Mining Co., Earlington, Ky., will deliver an address on "Recollections of a Mining Engineer," and motion pictures of "Coal Mining in Southern Illinois and Sanitation of Mining Villages" will be presented through the courtesy of the Federal Bureau of Mines. The Louisville Convention and Publicity League will also present pictures on "Beauty Spots in Louisville."

The Saturday morning session will start at 9:30, when the following papers will be presented: "Equipment of the Mines of the West Kentucky Coal Co.," by H. M. Ernst, division superintendent of the West Kentucky Coal Co., Sturgis, Ky.; "Coking of Coal in Harlan County, Kentucky," by J. R. Foster, engineer with the Wisconsin Steel Co., Benham, Ky.; and "The Miner and His Superintendent—A Story of Coöperation," round-table discussion by the members.

The program committee consists of K. U. Meguire, chairman, Louisville, Ky.; H. M. Ernst, Sturgis, Ky. and J. R. Foster, Benham, Ky. An address will also be delivered by E. R. Clayton on "The Value of Local or Group Associations to the Coal Industry of Eastern Kentucky."

Annual Meeting of Coal Mining Institute of America

The annual meeting of the Coal Mining Institute of America on Dec. 6 and 7 this year will be condensed into two days instead of three owing to the unusual activity in the coal industry. Discussion will begin on the morning of the first day, contrary to the general practice.

The early part of the morning session on Wednesday, Dec. 6, at the Fort Pitt Hotel, Pittsburgh, Penn., beginning at 9:30, will be devoted to the election of officers for the ensuing year. President Joseph Knapper's address will follow and the "Question Box" will be opened, W. E. Fohl acting as leader in the discussion.

In the afternoon at 1:30, the "Question Box" discussion will be continued, after which the following papers will be read: "Permissible Explosives," by F. H. Gunsolus, manager of the Technical Division of the Du Pont Powder Co., Wilmington, Del., and "Handling Mine Water," by L. B. Smith, mining engineer, of the Morrisdale Coal Co., Morrisdale, Penn.

The Institute dinner (\$1.50 per plate) will be held at the Fort Pitt Hotel at 6:30 p.m., the toastmaster being W. L. Affelder, general manager of the Bessemer Coke Co., Pittsburgh, Penn. Van H. Manning, director of the United States Bureau of Mines, Washington, D. C., will talk on "Federal Aid to the Coal Mining Industry," after which moving pictures furnished by the United States Bureau of Mines of Pittsburgh, Penn., will be shown.

On Thursday, Dec. 7, at 9:30 a.m., Nicholas Evans, state mine inspector, Johnstown, Penn., will read a paper on "Mine Accidents," J. T. Jennings, electrical engineer of the Philadelphia & Reading Coal and Iron Co., Pottsville, Penn., will present the "History and Development of the Electric Mine Safety Lamp," while "The First Year of Workmen's Compensation" will be the title of a paper by John Price Jackson, commissioner, Department of Labor and Industry, Harrisburg, Penn.

On Thursday afternoon, starting at 1:30, the following papers will be read: "A New Electrical Device for Detecting Gas in Coal Mines," by C. M. Means, of the Randolph-Means Co., Pittsburgh, Penn., and "General Mine Practice," by E. E. Girod, state mine inspector, Masetown, Penn. A general discussion of all papers will close the meeting.

COMING MEETINGS

The West Virginia Coal Mining Institute will hold its winter meeting Dec. 12 and 13, 1916, at the Hotel Frederick, Huntington, W. Va. Secretary, E. N. Zern, Morgantown, W. Va.

The Rocky Mountain Coal Mining Institute will hold its winter meeting at Denver, Colo., in the Convention Hall of the Albany Hotel, Jan. 22-24, 1917, beginning at 10 a.m. Secretary, F. W. Whiteside, Denver, Colo.

International Association of Industrial Accident Boards and Commissions will hold its first meeting at the Hotel Raleigh, Washington, D. C., Dec. 5-9. Dec. 5 and 6, Workmen's Compensation; Dec. 7, Sickness Benefits and Insurance; Dec. 8, Invalidity and Old Age Insurance, Pensions and Retirement Allowances, Social Insurance Applying Especially to Women. Among others, President Wilson, William B. Wilson, Harry A. Mackey, Samuel Gompers and William Green will participate. Royal Meeker, secretary-treasurer, United States Commissioner of Labor Statistics, Washington, D. C.

Federal Trade Commission and the Mining Industry*

BY EDWARD N. HURLEY†

SYNOPSIS—Declares that there is a great need for correct cost accounting and for a merchandising of coal on the basis of correct costs. States that the bankers should demand accounting of a better character than now obtains, and that accountants should receive United States registration. Does not feel sure that this will meet the situation completely and may yet recommend to Congress some form of Federal regulation.

The country should understand the stake that it has in the bituminous coal industry and consider the problems of that business fairly and seriously from all points of view. Where physical and economic conditions tend to the keenest competition, as it appears that they do in this industry, it follows that safety and conservation really depend upon efficiency. By efficiency I mean not simply efficiency of individual mines and individual companies, but efficiency in the industry as a whole. First, efficiency in production and distribution at the lowest cost consistent with conservation of life and of coal; and, second, efficiency in selling at the lowest price consistent with a fair profit and the perpetuation of the industry. To attain this efficiency of production and of price we need a third efficiency—efficiency in cost accounting. Efficiency in cost accounting spells knowledge, light, sanity. It means the industry's understanding of itself, which is the first essential to every step in its progress toward wholesome conditions.

EFFECT OF IGNORANCE OF COSTS

Let us take a look at this matter concretely. There are many operators who have no cost systems. They are the men who "go it blind." There are others who have cost systems, but some of them give accurate costs and some give costs that are not accurate. One operator's cost sheet is a true guide to him; another's is a will-o'-the-wisp that leads him into the mire of business ruin. He thinks he knows, but he may be charging to capital account what ought to go to operating cost; he may be forgetting his overhead expense; and most important of all he may fail to count on depreciation of his equipment and depletion of his mine. What is the result? Prices that look good to him are really suicidal. What he thinks are annual profits are really annual eatings-up of his capital; and even when the inevitable crash comes he may not know what it was that killed him. On the tombstone of many operations might truly be written the words, "This enterprise died of ignorant competition."

But ignorance of true costs does not affect only the operator who "guesses" his costs, or whose faulty cost sheets mislead him. They affect, often disastrously, the efficient operator, who knows his costs but is helpless against conditions induced in the industry by the ignorant price maker.

*Abstract of paper read before the American Mining Congress at the Hotel La Salle, Chicago, Ill., Nov. 14, 1916.

†Chairman of Federal Trade Commission, Washington, D. C.

Too often the operator who sets the competitive price may be the very man who disregards safety of life for cheapness of production, the man who wastes his coal rather than increase his costs to save it, and who in addition is ignorant of what his true costs are. Not till every operator in the industry is educated to an understanding of what this means will you be on the high road to a solution of the problems presented in the production of bituminous coal.

THE BANKER'S PART

Bankers are realizing this. The Pennsylvania R.R. advertises that, of all the people carried over its lines last year, not one single life was lost. The bankers of the country before long will be referring with pride to the minimum business death rate among their clients. Suppose Jones is operating a coal mine in Illinois on the "guess" plan; Smith is operating one on the "no depreciation" plan, or on the plan of "depreciation charged off when an extra good year comes along"; and Brown has an efficient cost system. Suppose all three come to a banker for loans for their mining businesses. What is the banker to do? He knows that Jones and Smith are likely to be waging a price war in the industry that will really net them losses where they think they are making gains; and he knows that this price war may impair the market of the efficient operator, Brown—and send him down to failure with the rest.

Low price-making based on guesswork or on partial costs is a menace to sound business. The menace is not in underselling, for competitors must expect to face the low prices due to efficiency. But even the most efficient cannot continually meet cut-throat prices based on ignorance. I believe bankers are in duty bound to insist on careful cost-accounting systems and sound financial statements before extending further credit to concerns whose unbusinesslike methods endanger the whole structure of business. Bankers will doubly aid business by insuring that business shall know its true costs before extending its operations.

I do not propose to shut off the credit of a small operator full of pluck and energy. I simply propose that the borrower's energy and pluck shall be intelligently directed. Individual force plus a true knowledge of costs means success—without such knowledge it too often drives a man to business disaster. It would be much better for him if the banker would require an adequate cost analysis before making the loan and so protect his client against a mistake that may mean a loss to the client, a loss to the banker, and an impairment of sound conditions in the industry.

A PLAN TO SECURE BETTER ACCOUNTING

I hope that in the not distant future each industry in this country will have developed a basic cost system that will fit its particular needs; that the question of a reasonable and adequate basis for depreciation will be worked out for each industry; and that these basic systems will be approved by the Federal Trade Commission.

I am now working on a plan that I hope will make it possible for manufacturers, merchants and business men generally to know whether their businesses are on a sound cost basis, and to go to the banker with confidence in the justice of their requests for loans. My thought is to give public accountants the opportunity of becoming registered United States Accountants under the general supervision of the Federal Reserve Board and to permit such accountants to certify under a United States seal the cost records and financial soundness of the concerns whose books they examine.

It is a well-known fact that the public accountants are willing and ready to do their part in seeing that the banker is presented with a statement or balance sheet that will show the real facts. The trouble is that many manufacturers are unwilling to agree with their accountants as to what amount shall be charged off to depreciation. When a public accountant attempts to make a proper charge for this, he is confronted by the manufacturer with a statement like this: "My machinery and buildings are as good as they were ten years ago, and your charge for depreciation is too high." The accountant, although anxious to do what is right, realizes that unless he is willing to agree with his client he is likely to lose him, and compromises by charging off an insufficient amount for depreciation. The next year similar conditions arise; and after this has continued for two or three years, it is a hard matter to treat this item in such a way that the balance sheets will be on a correct and sound basis. But when we have an officially approved basis for depreciation in that manufacturer's industry, the accountant and the banker working together will be able to bring the manufacturer into line.

I do not want you to get the impression from this that I am advocating that all books should be kept under governmental supervision, nor that public accountants should not be allowed to certify business accounts without a United States registry. But if a public accountant has his registry number, and if the manufacturer complies with the fundamental system, then let the accountant make and seal his certification in his capacity as a United States registered accountant.

Furthermore, you can readily see how such a plan would steady the bituminous coal industry—how it would automatically induce safer and more conservative methods, with unquestionable benefit to the entire industry.

UNIFORM COST-ACCOUNTING METHODS

The subject of more uniformity in cost finding is at present receiving the earnest attention of many operators and associations in the bituminous field. By a uniform practice, I mean a common classification of costs of production both inside and outside the mine, and of costs of selling; a uniform method of distributing overhead expense; a uniform method of providing for depreciation of plant and equipment with rates more or less standardized; and a uniform method of taking care of depletion of the coal. Please understand me, I am not advocating uniform costs, uniform depletion charges—that is palpably impossible—but uniform methods of getting at what the real costs are. Where uniformity of method is adopted you can get production statistics and cost statistics that are comparable, one company with another; you will all be talking the same language; you can profit by one another's experience, conduct your

operations more efficiently and price your output intelligently. When the industry is on an efficient cost-accounting basis, ignorant competition, which is your most insidious danger, will be a thing of the past.

The excellent financial condition of the iron and steel industry in recent years is owing in a marked degree to the attention iron and steel manufacturers have given to the important questions of business policy. Perhaps most important of these is the knowledge of true costs of production and distribution. I doubt if there is another industry in the United States where conditions in this respect are as satisfactory; where the destinies of the industry have been as wisely safeguarded by adequate provisions for exhaustion of capital, both of plant and natural resources; where there is as careful a study of methods of lowering costs and increasing efficiency. It is a gratifying fact that practically all iron and steel manufacturers are recording and classifying their costs on a substantially uniform basis, are distributing their overhead expense by the same methods, and are adequately providing for depreciation and exhaustion. It will be a proud day for the bituminous coal-mining industry when as much can be said for it!

THE CONTRAST IN BITUMINOUS COAL MINING

But what is the picture in your bituminous coal fields? It is said that the mines could readily produce 100,000,000 tons in excess of what can now be marketed at a profit. It is estimated by reputable authorities that for every ton sold half a ton is left in the ground. This means that for the 600,000,000 tons of bituminous coal that will be mined this year approximately 300,000,000 tons will be lost, of which possibly 200,000,000 tons could be saved, under thoroughly efficient conditions in the industry. Moreover, it is the cream of our coal resources that we are wasting so prodigally. We are now mining in the best and most accessible seams, and the greater the present waste, the sooner we shall be forced back upon the poorer and less accessible coals that will constitute the supply for the future. More serious for today than waste of coal is the surprising waste of labor. Of our 600,000 bituminous miners, approximately 500,000 are idle from 60 to 100 working days per year. In Illinois the mines ordinarily run only 180 days a year and over 70,000 men must be maintained in idleness three to four months out of every twelve.

Such inefficiencies as these should not be tolerated in any well-ordered business or nation. Is it any wonder that financial writers strongly criticize the conditions in an industry where inefficiencies like these are found? They say that for years the credit of bituminous coal operators has been far from good; that bankers have hesitated to advance adequate loans; and that the list of dividend payers is chiefly remarkable for its brevity.

WHAT THE OPERATORS CAN DO FOR THEMSELVES

In some degree the difficulties of the bituminous coal-mining industry are due to the faulty business methods of the operators. Many, as I have said, do not have accurate cost-accounting systems, and the greater number do not make proper charges for the depreciation of mining equipment or for the depletion of coal lands. Moreover, many companies fail to allow for the constant increase in the cost of mining coal which necessarily results from the extension of the mine workings. When

the mines are first opened and the coal is being taken from ground near the openings, haulage, drainage, ventilation and upkeep costs are all at a minimum. But as the workings are pushed out farther from the openings, the coal must be hauled farther underground, more water must be pumped, more power must be used for ventilation, and more men must be employed in caring for this work. If the mining companies do not make proper allowance for this natural increase in their costs, and from the beginning of their business make their prices with this fact in mind, they must expect to suffer the financial hardships that usually overtake the short-sighted man in any business.

The presence of inefficiencies on a large scale in an industry is an indication of serious trouble. But the first question in seeking a remedy is, What can the patient do for himself? Undoubtedly, better business methods on the part of individual operators, accurate cost-accounting systems, and price-making policies that have a sensible regard for the inevitable rise in the costs as the mines develop, can effect much improvement.

One of the most helpful ways in which improvement in cost accounting can be effected is through the study and establishment of uniform methods of cost accounting by associations of operators in different districts, or even in the industry as a whole. Such uniform, systematic and scientific methods of cost accounting have been adopted with marked success by cartels in various industries in Germany. Frequently special comptrollers, or "revision officials," visit the plants of the members and make sure that all cooperate on the same basis, so that the entire cartel operates as a unit.

WHERE THE PINCH COMES

But many of the bituminous coal-mine operators of the United States hold that their experience has taught them that when all has been done that they can do to improve business methods, a fundamental difficulty will remain. They believe that the primary cause of the wastes and inefficiencies of the industry is unrestricted competition. With a vast area of undeveloped coal lands on which mines can at any time be opened, and an ever-present potential overproduction from mines already in operation, competition tends to force the price of bituminous coal at the mines to the level of the lowest cost of production. This lowest cost of production, though sometimes obtained by highly efficient methods of mining, is too often obtained by mining only coal which can be taken out most cheaply and abandoning all the rest; by skimping on the installation of safety devices and risking accidents and explosions; by cutting depreciation and depletion charges to the minimum or wholly disregarding them; by considering only the low initial cost of mining, and not the later higher costs—in short by all the objectionable tactics which lead to inefficiency and waste of coal and human life.

That is where the pinch comes. The operators believe that unrestricted competition places a premium on inefficiency, on waste of the natural resource, and on disregard of life. They believe it puts it beyond the power of the operators themselves to effect their own cure. They believe collective action with constructive aid and regulation by the Government is necessary for any effective remedy. With this analysis and view labor organizations in the industry agree.

This is a significant situation. The people in a basic industry—operators and miners together—tell us that their industry has for years been tending increasingly to demoralization as its normal condition, and that periods of prosperity are notable exceptions to the rule. They lay their cards on the table and ask the Government for searching study of the facts and such relief in the common interest as the facts warrant. That is the problem put up to the Federal Trade Commission. At the direction of Congress it is organizing a thorough-going inquiry, and when it has all the facts before it, it will make constructive recommendations to Congress, which it hopes will reach to the roots of the trouble.

Intelligent competition is an adequate regulator for most of our industries. Government regulation is not necessary or desirable as a general policy in this country. We do not need it. Competition, intelligently directed, may be relied on in nearly all cases to take care of both public and private interests.

But exceptional cases may arise when competition fails to regulate. If such a case does arise, Government should step in and regulate; it should use its power in behalf of the common interest to do what competition failed to do.

IS COMPETITION A CURE OR A CAUSE OF EVILS?

If the Federal Trade Commission's study establishes beyond dispute that bituminous coal mining is an industry that can cure its troubles simply by greater efficiency, more intelligent competition, and such cooperation as the law now permits for improving conditions, then the matter is up to the operators themselves. The commission will gladly give such help and suggestion as it can, but the industry must take itself in hand and work out its own salvation.

On the other hand, if the facts show that in this industry unrestricted competition is the primary cause of business ills, rather than a cure for them, then the matter is up to Congress and to the public. I personally would favor any measure of Government regulation that may be found necessary and suitable in order to effect a real remedy. In my judgment, if ruinous and destructive competition exists in a great industry like this, it cannot be allowed to go on. The waste of human life, the waste of coal, the waste of labor and the resultant loss of wages, the financial instability of the large investments in this industry vitally concern the national welfare. When we have diagnosed the disease, when we have found the cause, we must not hesitate to apply the remedy. Our vision must not be narrow; we must look, not to the past, but to the future. If the well-being of a great industry demands a forward step in national policy, let us not be afraid to take it.

But whatever the outcome of the Federal Trade Commission's inquiry, one great practical benefit ought to result. It is my hope that the commission's careful analysis of the costs of bituminous coal companies in all the different fields will develop a broad and sound basis for uniform accounting methods, either in the separate fields or possibly in the industry as a whole. If this can be brought about, you will have taken a long step toward the realization of your inspiring watchwords—Safety, Efficiency and Conservation, and you will be ready to face the difficulties in your path with new courage and intelligence.

New Rescue Apparatus of the Bureau of Mines

Dr. John Scott Haldane, the noted English physiologist, recently delivered a number of scientific lectures at Yale University, New Haven, Conn., and Johns Hopkins University, Baltimore, Md. He took enough time from his lectures to visit the Pittsburgh experiment station of the United States Bureau of Mines. He expressed much interest in the various investigations that are being carried on in behalf of the miner and put on and wore the new Gibbs oxygen breathing apparatus, which is now undergoing severe tests by the rescuers of the bureau. In fact Dr. Haldane made the statement that although



DR. J. S. HALDANE

The noted English scientist is here shown wearing the new Gibbs apparatus

the apparatus had certain defects, which might be modified, it was the best apparatus that has yet been devised.

Dr. Haldane is said to have remarked that no matter how much he exerted himself when in the apparatus it never failed to supply him with the needed oxygen. In a recent article read before the Canadian Mining Institute James M. Stewart, speaking of apparatus in general, declared that "the amount of muscular energy expended must be made to correspond to the output of oxygen of the apparatus. The oxygen supply cannot be regulated to suit calls on muscular energy as they may arise in the mine. Cool, calculated work is what is likely to make a man wearing the apparatus a success as a member of a rescue party."

Should the coördination of need of oxygen with its supply prove as perfect in the Gibbs apparatus as has been anticipated, then evidently an important step forward will have been made.

Another Experimental Coal-Dust Test

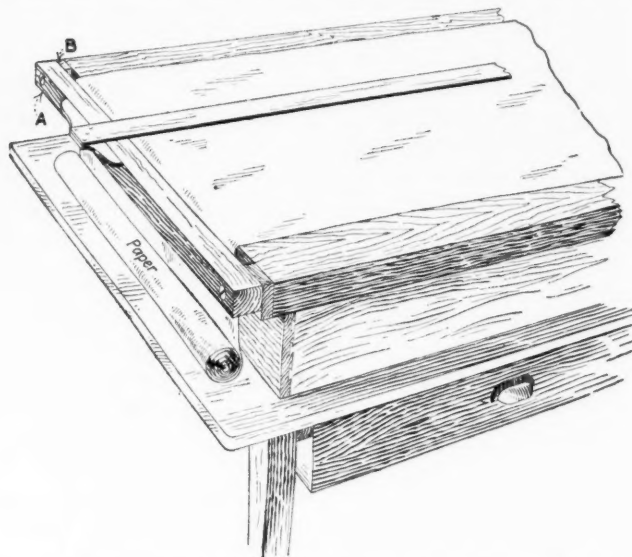
The Experimental Mine of the Federal Mining Bureau at Bruceton, near Pittsburgh, was the scene of another experimental explosion of coal dust on Friday, Nov. 16. More than 300 such tests have been made since the Government inaugurated this practical method of gathering data relative to the explosibility of various dusts.

In this last test the dust came from a mine in the Clearfield (Penn.) district. In this region there has never been a dust explosion. The operators naturally contend that the dust in the Clearfield mines is not a dangerous factor. Insurance companies take a different point of view. The test on Friday at Bruceton was conducted for the purpose of shedding light on the disputed question. Whether or not the experiment will change the present views of the parties concerned is doubtful.

The Clearfield dust that was placed in the mine exploded in no uncertain way. However, the conditions under which the experiment was carried out were propitious for such an explosion. Do such conditions actually exist in any of the Clearfield mines? Mr. Rice and his assistants were noncommittal in so far as their opinions in the matter were concerned.

Arrangement of Drawing Board for Handling Large Drawings

In the making of layouts an occasion often arises where it is desirable to use a sheet of paper which is longer than the board. This would prove rather an awkward task were the board handled in the usual manner, but by ar-



ARRANGEMENT OF DEVICE ON DRAWING BOARD

ranging the board as shown in the illustration a sheet of flat paper of any length may be used.

The arrangement consists of a strip of wood, or steel, *A* screwed in the edge of the board. The blocks *B* are placed between the strip and the edge so as to leave a space through which the paper may be passed.

This scheme permits the paper to be run through the slot and over the board, and allows the roll to rest on the table.—M. Favor in *American Machinist*.

Editorials

Edward N. Hurley's Address

The address delivered by Edward N. Hurley, chairman of the Federal Trade Commission, before the American Mining Congress contained little that was new. Perhaps originality can hardly be expected in an orator who has already delivered many speeches on much the same subject. Perhaps being a propagandist and not a lecturer he believes with another and greater propagandist that "To write the same things to you, to me indeed is not grievous but to you it is safe."

Unfortunately, as Mr. Hurley suggests, though he does not declare it, correct cost accounting will only show the need for higher prices of coal. It will not show how to secure them when the demand for coal is at a low ebb. In fact, it is doubtful whether our present cost accounting is really so extremely illogical. We do not consider overhead, insurance, depreciation, obsolescence, and what not, because too often these charges must be met whether the property is operated or not. Worse yet, an idle mine may mean increased charges for some or even all of these items. Hence it is that if all the charges are put on the books, they must be disregarded in the face of competition.

In fact, while correct cost accounting will undoubtedly have a tonic effect, it will not cure in itself existing conditions. Very often the most intelligent and well-posted concerns are those which sell at prices that Mr. Hurley rightly declares are lower than cost. It will be remembered that it was Harrington Emerson, the efficiency expert, who showed at a meeting of the Coal Mining Institute of America—what every coal man knew long ago—that it sometimes pays to sell coal at a loss. It is not cost accounting, but coöperation alone that can prevent the cutting of prices to an unprofitable level. Unless we face this fact we can do little, and it is to be feared that E. N. Hurley can not accomplish much for the industry.

In fact, sometimes it appears that Mr. Hurley is still only a student of mining—a keen, intelligent student, with a deep insight it is true, with an impelling way of writing down what he has learned so that the public will understand even if it does not heed what he says—but still an unfinished student of the business.

Mr. Hurley overlooks the fact that the power to produce coal is not much in excess of the peak load of the industry. The possible annual production is of course far greater than the maximum annual demand, and in the summer the operators can even more easily supply the extremely restricted needs of the market.

But the short time of the mine worker is a difficulty not to be solved satisfactorily even by coöperation between operating units, still less by mere cost accounting. It must be met by differentiated rates between winter and summer, and by the stocking of coal by coal corporations. Perhaps correct cost accounting may stimulate coöperation, and that in turn may give the companies a chance to put in force the seasonal differential rates already in use in the anthracite region, and also may give the companies the funds for storage.

But it must be remembered that as bituminous coal tends to fire, storage must be under water, or over a huge area, or as coke. Probably the introduction of byproduct ovens may be the solution of the storage problem. The very regularity of the demand for industrial gas may keep the mines working steadily and tend to prevent anything approaching an attempt toward a peak load; for such a load would mean a waste of gas either actually or in the coal sold. All this would mean that the art of coking and near-coking would have to be developed to suit certain classes of coals and lignites, now not available for that purpose.

After all, the need for education is not so much for the mine owner as for the coal buyer. What right has the purchaser to work himself into a frenzy about a coal famine if he has neglected the six months in the year in which he had an excellent chance to stock his cellar? Why should he upbraid the operator because he stands "all the day idle" if the purchaser did not enter the market place till the eleventh hour? What justification is there for the violent abuse of the railroads for failing to supply cars when the purchaser of coal has deliberately passed over six long months of coal-purchasing opportunity?

The public goes out to buy too late. It creates its own difficulties and petulantly blames the industry. Where is the brave man among all the predatory interests now ruling in Washington who will tell the citizens with their many votes that what they suffer is what they richly deserve? They have starved the miner and the industry in the summer, let them shiver in the retributive fall.

After all, the short time in the coal industry—that is, the few working days per year—is not so much shorter than in the farming, lumber and railroad industries. It is a seasonal industry and one also affected by the doldrums of business depression and by the fair breezes of industrial prosperity. But there are other seasonal businesses besides coal mining, and few businesses but publishing go on with a steady grind year in and year out.

Bark only peels in the spring, plowing and harvesting come in spring and summer, sledding is an occupation of the winter, salmon canning occupies the period when the salmon are running in the stream, domestic trades are vigorous in the spring and fall, when householders are moving, while lake shipping ties up during the winter months. Why so much lament because coal mining does not strike the merry chime of prosperity unerringly every hour of the day, every day of the month, every month of the year. There are no industrial clocks which do not occasionally slip a cog.

Besides, some of the faulty operation of the mechanism is due to the clock tinkers of Washington who are always pulling the works apart to find what makes them run so badly. And of all tinkers, those we have had in Washington—we do not speak at all of E. N. Hurley, who we respect and appreciate—have been the worst the country has ever seen.

A Christmas Appreciation of Real Value

The season of good cheer will soon be upon us—it's now a matter of weeks—soon it will be days.

Then comes the hustle and bustle for things useful and otherwise to make happy the kiddies and the wife that is or the wife-to-be.

But the men around you—those under you—those who look to you for instruction and guidance in their work—all members of your official family—what are you going to do this year to extend to them the spirit of helpfulness and good cheer?

And while everywhere "spugs" and antis are making suggestions for useful and useless gifts, *Coal Age* takes pleasure in presenting the suggestion of a West Virginia mine manager, who says:

"I am going to extend my Christmas giving this year to some of the boys who have been helping me. I want you to send *Coal Age* every week, beginning with the Christmas number, to the names on the attached list, and send the bill to me. Please see that they get the first number around Christmas, and if consistent with your policy, drop each man a line that will reach him with his first copy, with my compliments."

Aren't there many mine executives and proprietors who want some little way of expressing their appreciation to their responsible heads and subheads for conscientious services rendered, and at the same time help and encourage these men in their work?

Is there a better way than that devised by our West Virginia friend?

Most Christmas gifts are outworn and forgotten in a few months. But here's one that lives and grows with each week. Each weekly copy brings a renewed helpfulness and encouragement to the recipient. It's a Christmas spirit that lasts.

We're bringing this suggestion to you real early; if you're interested, you'll want to know more about it; that will take time. If you've got to bring this thing before the "board"—that, too, will mean delay; but if your orders get here real soon, our circulation department promises to do its share to get the first copy out at the right time and will arrange to send an especially prepared card to the favored one, properly and duly inscribed.

A Deficiency in the World's Coal Supply

A study of the export trade of the world discloses an enormous apparent deficiency in the coal supply that is puzzling our best informed men. It is a condition that it is becoming increasingly difficult to account for.

For the first nine months of the current year, Great Britain, by far the dominating factor in the world's coal market, exported 31½ million tons, which would indicate an export business amounting to about 41½ million tons for the year. In 1913, the last normal year previous to the war, Great Britain exported 76½ million tons; deducting from this 9 million tons shipped to Germany, leaves an apparent deficiency of 26½ million tons.

Germany, the next large exporter, has of course been eliminated entirely as a factor in the world's coal market. In 1913, Germany exported 44 million tons of coal and coke, of which only about 13 million tons went to markets to which she is still able to ship, chiefly Austria-

Hungary. The withdrawal of Germany from the export business, therefore, means a further deficiency of 31 million tons, which, added to the British loss of 26½ million tons, makes a total deficiency of 57½ million tons in the world market.

During the first year of the war, manufacturing was at such a low ebb that the loss may be partially attributed to an equal decline in consumption. The second year, however, is more difficult to explain. The discrepancy may be covered in part at least by an increased production in the less important coal-producing countries. Africa, New Zealand, Australia, India and Japan seem to be making great gains in their output, and it would be natural to suppose that on account of the high freight rates much coal has been moving into markets near the above-mentioned countries.

It should also be remembered that the English export figures, as we get them, no longer contain the large tonnage of Admiralty coal; neither do they mention cargoes loaded in Government-owned ships. Just how much these exceptions affect the English export figures it is of course impossible to say.

Our own export figures show a decrease for the first nine months of 1916 as compared with the corresponding period of last year, but the bunker tonnage has increased about 25 per cent., so that there is a net increase of about 5 per cent. in coal going off-shore when we consider bunkers and exports together. This increase in bunker coal is due to high prices at coaling stations throughout the world, on account of the cost of water freights, and also the higher price of coal; ships are now taking as much bunker coal as possible here and at ports of other coal-producing countries. The greater bulk of the export coal of the world is used for bunker purposes, so that this coal is now moving to a greater extent in ship's bunkers, rather than in expensive cargo space.

Good Shipments on Coastwise Contracts

Most of the agencies in the coastwise trade are keeping up well with their contracts, considering prevailing conditions. There is surprisingly little complaint from consumers who adequately covered themselves, and it is the opinion that the Hampton Roads shippers have done notably well under all the adverse conditions.

Most of the coal from Norfolk and like ports goes to New England in steamers, practically all of which have recently been able to make schedule time. The result is a fairly comfortable feeling on the part of consumers on Tidewater and inland from distribution points like Boston, Providence and Portland, who made contracts for their entire supply.

Most of the Hampton Roads factors announced on Nov. 16 that their bunker price for the calendar year 1917 would be \$5 plus trimming. This considerable advance over the 1916 price gives some line on contract coal next year. Those agencies that closed recently at \$4 bunker coal for next year were perhaps somewhat previous.

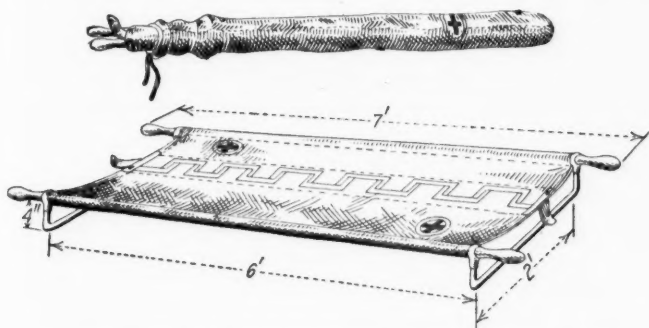
Cargoes of Georges Creek in the New England trade are now extremely rare. The chief factors in that grade are loading their barges and steamers with other grades for the most part, and even at that they are in arrears on their contracts.

Department of Human Interest

Not an Improvised Stretcher

If improvisation is sometimes badly needed in first-aid work, it is not in the matter of stretchers, though we are always seeing them improvised at first-aid meets. It is a sort of stage trick which takes well with the public.

Every industrial plant now has a stretcher, and we can usually wait until it comes; for there is so much to be done before it is needed. If we could improvise a pulmotor or a lungmotor or a life motor, which would give equal service with those admirable machines, we would accomplish much; for time is short and precious when

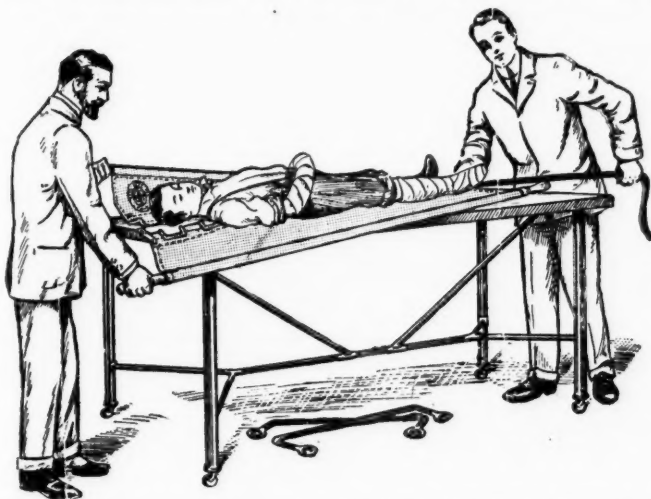


A STRETCHER THAT IS DIVIDED IN THE MIDDLE

they are required, and artificial respiration, though it should be by all means put into operation, is not so effective as we would wish it to be.

We can usually wait for the stretcher, and yet when it does come it is too often only an improvisation, not of the moment, it is true, but of the mine carpenter. It is apt to be like all homemade products—heavy, awkward and insanitary; the injured person who looks to it for relief finds it a bed of pain, and the bearers who support it realize that it is a heavy load to carry.

The stretcher illustrated folds away into a small compass. It does not occupy a needless amount of space in the mine-rescue shed or the weigh office. It is so arranged that it can be reversed and carried upside down. The



REMOVING STRETCHER WITHOUT RAISING PATIENT

depth needed to pass an ordinary stretcher over fallen rock or standing cars is the full depth of the stretcher plus the vertical space taken up by the injured man. This stretcher does not have much depth, and when reversed the space occupied is solely that needed by the patient,



INVERTING THE STRETCHER IN A LOW PLACE

for the stiffening rods do not project as far upward from the stretcher as does the injured man's body.

The stretcher web is made in two parts, each of which is toothed and dovetails into the other. A strap is passed through these indentations and holds the web solidly together until the strap is withdrawn. When, therefore, the patient is lying on the stretcher and it is desirable to transfer him to the operating table, it is not necessary to lift him off the web of the stretcher. The patient can be lowered onto the table, the strap can be withdrawn, and the two halves of the web drawn away from under him. Thus he reaches the table without shock or trouble.

The web not being fixed by nails to the framework, as in the objectionable wood stretcher, can be taken off and washed and hung on a line to dry. This appliance is made by the Williams' Improved Stretcher Co., 1202-1204 Water St., Wheeling, W. Va.

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Tuberculosis in Coal Mines

Dr. W. A. Lynott, of the United States Bureau of Mines, in a paper on "Bureau of Mines' Studies of Occupational Diseases," read before the Division of Industrial Chemists and Chemical Engineers of the American Chemical Society, at its 53rd meeting held in New York City, Sept. 25-30, said that tuberculosis is not common among coal miners. Dr. Lynott said that he had occasion to visit a district in 1913 and 1914 where there were about 7,000 coal miners. While a physical examination was not made or suggested, the doctors in the various camps unhesitatingly said that rarely is there a case of tuberculosis found among the miners. All told not over 15 cases were admitted by the doctors. It was true that some

members of the miners' families were affected, but the miners themselves seemed to have a certain immunity. Many mine surgeons, he said, were of the belief that the coal dust, in a measure, was responsible for this immunity.

Better ventilation in the mines is believed to have resulted in fewer cases of asthma among miners. In the olden days many of the miners had miners' asthma, and it was thought to be owing to coal dust inhalation. In recent years, however, asthma among miners is rare, and this improvement is due in a measure to better ventilation in the mines.

Miners' nystagmus was also discussed in the paper. Dr. Lynott referred to the report made by Dr. Frederick T. Hoffman and found in the United States Bureau of Mines Bulletin No. 93. In the report it is claimed that miners' nystagmus is the result of a peculiar form of eye strain which often results in the impairment of vision and consequent diminution of the wage-earning capacity of the workman.

Nystagmus is found chiefly in miners who work at the coal face in a more or less constrained position of the body and the eyes. A man lies almost on his side with his legs crooked up and strikes the coal with a horizontal swing of his pick at the bottom of the coal seam. A miner engaged at this work will direct his gaze to different places as it becomes necessary for him to strike, for the eyes will follow the pick point, but the tendency will be for the gaze to be directed more or less obliquely upward, the man using the ocular elevation. The miner will be bent over sometimes on one side and sometimes on the other, and his head will be thrown back and flexed more or less on the shoulder beneath.

The symptoms are oscillation of the eyeball, objects dancing before the eyes, both eyes being affected, headache and giddiness. Tremors of the head, of the eyelids and of the muscles of the face or neck are often associated with the other symptoms. The patient can usually expect to get better even in cases of long standing if the directions as to change of work are followed.

Dr. Lynott said with regard to the prevalence of hookworm in this country that preliminary investigations have shown comparatively little in Northern coal mines, although it is undoubtedly prevalent in Southern coal mines.

He also said that J. H. White, of the Bureau of Mines, had recently completed an exhaustive study of the hookworm in deep California mines and he found that the spread of the disease is due to the warmth of the mines and to climbing up and down ladderways, it being very easy for the infected mud to get on the hands of the miners.

Local Mine Institute Activity

The local mine institutes have now fairly started on their winter sessions. One of the most important and best is the Nanticoke District Mining Institute, which on Oct. 14 served the most numerously attended banquet which has ever been spread in the State Armory at Nanticoke, 1,100 members being seated at the long tables. It was the sixth banquet in the history of the institute, and the attendance was so much larger than even that of last year that the institute officials were much gratified, feeling that it gave promise of a successful year for study as well as for feasting.

P. H. Dever, superintendent of the Truesdale colliery, who was the first speaker, told in interesting fashion of the growth of the institute and referred to the good being accomplished through the vocational schools. Evan C. Jones and Michael Donahue spoke in similar vein, encouraging the young men, and the older ones also, to take advantage of every opportunity which these institutions offer.

State Commissioner of Labor, John Price Jackson, was also one of the speakers. President Judge Fuller was toastmaster, and the entertainers were Adam Yonkoski and Charles Gallagher. Members of the Women's United Workers of Bethel Congregational Church served the dinner, and the invocation was given by Rev. Father Biszysko, of St. Stanislaus Church. The Nanticoke Mining Institute has more than 1,800 members, a record of which the officers are quite proud.

The Y. M. C. A. of Wilkes-Barre opened its mining school on Oct. 17 with about 60 students registered, which with others who are expected to enroll within the next few weeks will make it one of the largest classes that has yet been formed. Sessions will be held each Tuesday and Friday evening from 7:30 to 9:30.

A new staff of teachers has been selected, each one chosen because of especial fitness in the subject assigned. Robert E. Goynes, mining engineer, formerly instructor of mining engineering at Hazleton, will teach surveying, mine law and general subjects to advanced classes. Frank Nicholson, electrical engineer, formerly with the Westinghouse Manufacturing Co. and the Vulcan Iron Works, will teach arithmetic, mechanics, air compression, electricity and magnetism. Guy C. Faust, mining engineer, will teach arithmetic, mine gases, ventilation and mine law.

A branch school has been opened in Edwardsville. The borough of Plymouth has offered courses in mining and has appointed Elmer Jones and Albert Pilgret as teachers. The school will be held in the Central Building.

Newport Township school directors have appointed Peter Turk as head of the mining class opened during the week, and increased interest is being manifested in this work. The class will be taught mine ventilation and mine arithmetic problems, together with other matters of vital importance to the miner.

In the bituminous regions of Pennsylvania a class will be opened in the Mount Pleasant Township high school building on Monday and Thursday evenings of each week during the winter. James Wardlaw, of Scottsdale, who has instructed many mining men who have secured mine-foreman and fire-boss certificates, will be the instructor. At the last state examination 78 out of 87 of Mr. Wardlaw's pupils were successful in obtaining certificates. The school will be conducted under the vocation division of the State Department of Public Instruction.

Naturalization School at Mount Pleasant

The naturalization school at Mount Pleasant, Penn., the establishment of which was proposed recently by General Superintendent Lynch, of the H. C. Frick Coke Co., has been organized by Prof. U. L. Gordy, with Norman Hayes as teacher.

On the first night 12 men were enrolled; of these 11 were Italians and the other man an Assyrian. The men are employed at the mines in the vicinity of Mount Pleasant or in the glass factory at that place. When the first real session of the school was held five more men were enrolled. These, too, were Italians. One of the Italians and the solitary Assyrian labor under the disadvantage of having had no schooling in the lands of their origin. But the other men are not much more advanced, as they are not able to read or write English.

The work is elementary, and the lessons in spelling, writing, reading, civics and history are so simple that they are easily understood. Knowledge of these branches is needed previously to taking out naturalization papers. Those enrolled have filed either first or second papers and manifest great interest in this work.

General Superintendent Clay F. Lynch, of the H. C. Frick Coke Co., pays the salary of the teacher as long as 10 or more students attend. Classes will be held three nights a week, from 7 to 9. The Mount Pleasant School Board provides the room, light and heat. Norman Hayes, the teacher, promises to make a big success of the school.

The Cost of Food Rose 16 Per Cent. in the Year from Sept. 15, 1915, to Sept. 15, 1916. On the latter date it was 20.8 per cent. higher than four years before, 14.9 per cent. higher than three years before and 9.4 per cent. higher than two years before. In the year from Sept. 15, 1914, to Sept. 15, 1915, the cost of food fell, the index number dropping from 106 to 100. The fall was more than made up in the year following, when index numbers rose from 100 to 116, or as just stated, 16 per cent. The figures given are those of the Bureau of Labor and are based on the retail prices of 27 articles: Sirloin steak, round steak, rib roast, chuck roast, plate boiling roast, pork chops, smoked bacon, smoked ham, pure lard, hens, canned salmon, eggs, creamery butter, cheese, milk, bread, flour, corn meal, rice, potatoes, onions, navy beans, prunes, seeded raisins, sugar, coffee and tea.

Discussion by Readers

Economy in Mining System

Letter No. 1—Referring to R. J. Sampson's article, *Coal Age*, Sept. 23, p. 494, I would like to ask why it was thought best to turn the cross-entries on 300-ft. centers, giving only 150-ft. rooms. Why not use 600-ft. centers, giving rooms 300 ft. in length, which would allow twice the amount of coal to be mined for the same entry expense?

It has been my experience that 300-ft. rooms, under fair conditions of roof and floor, are not too long for either machine or gathering-locomotive cables. Further, with roof conditions such as this system was designed to work under, why not drive all entries room-wide and dispense with necking the rooms, by turning them off the entry room-wide?

Where it was found that the roof did not break readily, necessitating shooting, it is my belief that if the rooms had been turned off one entry only, and the line of break once established in the roof, allowed to continue over each succeeding pair of entries, this trouble would in a large measure have been done away with.

C. A. HERBERT,
Mining Engineer.

Cameron, Mo.

Gasoline Motors in Mines

Letter No. 5—Kindly permit me to draw attention to one or two statements in the letter of P. M. Sherwin, *Coal Age*, Oct. 21, p. 688, regarding the safety of the use of gasoline motors in mines. Mr. Sherwin makes one or two statements that are wholly erroneous and misleading, and which might be the cause of serious mistakes being made by those contemplating the installation of this type of motor in their mines.

In the first place, he recommends estimating the volume of the exhaust gases from the piston displacement of the cylinders. But anyone familiar with the operation of a gasoline engine knows that such a method of estimating would be quite inaccurate. It is needless to say that where carbon monoxide is in question, one of the first considerations is the accurate measurement of the exhaust gases; and this can only be obtained by careful observations made on the discharge from an orifice.

However, assuming that we have been able to measure the volume of the gases exhausted from the cylinders of a gasoline motor, the next point of interest is to determine the percentage of carbon monoxide in these gases. My friend very wrongly assumed 1 per cent. of carbon monoxide as an average condition. I would like to ask where he gets his authority for this basis of estimate. Not long ago the United States Bureau of Mines made a careful investigation of the performances of gasoline motors under different conditions. The results of these tests were published in Bulletin 74, entitled, "Gasoline Mine Locomotives."

These tests made by the engineers of the bureau were exhaustive and showed percentages of carbon monoxide,

in the exhaust gases, varying from 0.1 to 15.49 per cent. In all 67 tests were made and only four of these showed as little as 1 per cent., the figure on which my friend bases his estimate. Judging from the results of the bureau tests, to which I have referred, there would be needed about twenty times the quantity of air estimated to produce the same factor of safety given in Mr. Sherwin's letter.

In closing I desire to add that the amount of carbon monoxide given off by a gasoline motor does not depend so much upon the engine itself; that is to say, upon its style, dimensions and speed, as upon its proper adjustment. And what does the average motorman know in this respect?

O. L. PUCKETT.

Coalhurst, Alta., Canada.

Throw Away Your Hammer

Letter No. 1—A short time ago I read an article entitled, "Don't Be a Knocker," *Coal Age*, Sept. 2, p. 376, in which the writer described "three different kinds of knockers."

That any mine foreman could have in a mine in his charge three kinds of knockers surprised me very much. My experience of 30 years in the coal mines, doing almost every class of work from trapper boy to mine foreman, suggests to me that few, if any, first-class, competent and efficient mine foremen have ever been injured by their men's knocking.

I do not wish to cast any reflection on the author of that article, but it is my experience that when a coal miner complains of his treatment by the foreman, he speaks from facts. The average miner has a fair knowledge of mining conditions, knows the wage scale and can generally estimate the amount of his pay to a dollar. He can tell quickly when the foreman has a desire for him to make good wages and is willing to help him do this by supplying him with needed rails, spikes and props promptly when they are ordered, and to compensate him justly for dead work.

MEN KNOW AND APPRECIATE A GOOD FOREMAN

The foreman who does his duty by his men along this line will have his praises sounded right and left. But when one hears the actions of a foreman criticized and condemned by his men, he can rest assured that that foreman has not been playing fair and square. My experience teaches me that few miners will waste their time going around the mines sowing seeds of dissatisfaction among their fellow workers, as claimed by our friend in his article. But, should a miner do this, it cannot injure a foreman who is square in his dealings. Clean water will run clear.

Then, let me say, Throw away your hammer and get a horn instead. Get on the band wagon for competency and efficiency in coal mining. For some time past I have been studying the music of harmony among mine workers who all join in playing that stirring march, "Safety

First." I have tried to play my part in that grand overture entitled, "Industrial Peace." All mine foremen and superintendents are bandmasters, whose duties are to see that every man plays his part, keeping time in the melody.

When the working forces in a mine are thus organized, no one can doubt the results. If there is any discord by one who is playing out of tune, he must be shown his mistake and correct it or be put out of the band. Under these conditions the world is the audience. I would style the competency of the foreman as a "melody in C" and the efficiency of every mine worker as a "melody in E." The charms of these conditions are not wholly imaginary, but altogether possible where the mine foreman successfully plays his part.

ROBERT A. MARSHALL.

Farr, Colo.



Seasonal Mine Explosions

Letter No. 2—Referring to the comment on the frequency of recent mine explosions, *Coal Age*, Nov. 11, p. 809, suggesting that their possible cause may be the "press of business," permit me to say that the reports I have read of some of these explosions will not justify the conclusion that the men in charge of the mines were guilty of any neglect.

In my opinion these men did not recognize the existence of certain dangerous conditions affecting the safety of mine operations; and they are not, in my judgment, to blame for this. The fault of their want of preparedness in this regard lies rather with the mining experts, whose duty it was to have exploited these conditions along the practical lines previously suggested.

Investigators have failed to complete their task and as a result the men in charge of mining operations are continually exposed to conditions with which they are hardly familiar, and which find them unprepared.

Allow me to remark that it is just as uncharitable to hold mine foremen responsible for the safety of mines, in regard to conditions over which they have little control because of their limited knowledge of the same, as it would be to hold the nurse responsible for a faulty diagnosis of the doctor.

I need not here point out the particular phase of investigation that would, I believe, tend to elucidate our ideas and increase our knowledge in regard to the prevention of mine explosions. These suggestions will be found in Vol. 6 of *Coal Age*, pp. 519 and 762.

JOHN VERNER,

Chariton, Iowa. Former District Mine Inspector.



Textbooks in Examination

Letter No. 1—There is one subject that I intended to mention when writing in respect to mine foremen's examinations, and that is the use of textbooks by candidates in the examination. This question has often been referred to in *Coal Age*, but it has never been so thoroughly discussed as I think it merits. Examining boards would then understand what is the prevailing opinion of mining men on this subject.

A while ago I mentioned the matter to a mining man of my acquaintance, and he strongly condemned the suggestion, claiming that the questions involving the use of formulas and other constants to be found in textbooks should not be asked at a practical examination. I could

not quite agree with him in this opinion. As stated in my previous letter, I believe that every mine foreman should know something of the theory of mining, and this knowledge should include those simple formulas that are necessary for the solution of ventilation problems, as well as many in mine haulage, pumping and timbering.

I think every candidate in examination should know something of figures, so that he can calculate the area of a circle from its diameter and be able to apply the simple formulas used in ventilation. In my opinion all foremen should be practical mining men, capable of instructing others how to solve the different problems with which they will come in contact every day in the mine.

To illustrate, let me assume that a man 35 years of age, a practical miner but having little education, comes to the conclusion that he will try for a mine foreman's certificate. He realizes that he must study in his spare time. He works every day, perhaps digging coal, and comes home tired. But, being determined to get a certificate, he starts at the beginning and studies hard, with the result that he is able after a while to handle the simple formulas found in his textbook and can work many problems in ventilation, haulage, pumping and timbering, which are the important questions in respect to the theory of mining.

THE PRACTICAL MINING MAN IN EXAMINATION

The time comes around for the examination and our friend presents himself with a number of others many of whom are 10 or 12 years younger and have the benefit of an early education. The questions are handed around and everything goes well for a time. The man readily answers everything asked on the mining law and practical mining, but when he comes to a question in pumping, or we will say ventilation, he fails to recall a certain constant required or to remember just how to twist the formula

$$p = \frac{k s v^2}{a}$$

so as to calculate the quantity of air that will pass in a certain mine under a given pressure. The result is that he must either let these questions slip or run the chance of getting twisted in trying to answer them. The younger men, with less practical knowledge and experience, have no trouble with any of these questions, and their papers receiving a passing mark, they are granted a certificate, while our friend gets but 71.5 per cent. and fails in the examination.

No argument is needed to prove that had this man been allowed to look into his textbook for a brief moment, as when at home he studied those questions, he would have passed an A No. 1 examination. The use of the textbook in the examination would have placed him on an equal footing with those younger chaps, who, in spite of their certificates, are far less capable of running a mine than our practical friend with his limited schooling.

STANDARD NOT LOWERED BY USE OF TEXTBOOKS

It has been claimed that to introduce a textbook into an examination would detract from the high standard set by the board for the qualification of candidates. I cannot see, however, that this is true, since the candidate must still study in order to familiarize himself with constants and formulas and be able to apply them correctly. But there is the advantage that the hard working and tired practical man need not then rack his brain in the

attempt to memorize these formulas, which he will only remember for a brief time at the most.

In closing I want to say that I am strongly in favor of the use of textbooks in examination, and believe that the examination will thus be made more practical, inasmuch as it will then be possible to cover both the theory and practice of mining. I know what it is to come home from the mine tired and attempt, in that condition, to memorize the more important formulas and constants, only to find on going to the examination that the questions asked involve the use of one or more formulas that I had not committed to memory. Had textbooks been allowed, at that time, I would have had no difficulty in answering the questions. As has been claimed in *Coal Age*, candidates in examination should be placed under the same conditions that surround them at home or in the office, in order to determine their ability and knowledge of the theory of mining.

THOMAS HOGARTH.

Heilwood, Penn.

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Service and Wages

Letter No. 2—I read with great interest the letter of former District Mine Inspector John Rose, *Coal Age*, Oct. 14, p. 650. Mr. Rose, discussing the effect of an increased wage on the service rendered, makes the following statement, "The honest employee when working for \$3 a day will do no more or better work if paid \$4 a day." I believe this is a true statement and reflects the inclination of the average workman to render adequate service for the pay he receives.

It is common, however, to hear men employed in and around the mines remark, "If I was getting a little more pay, I would do more work." Or, "I believe I have done enough for the pay I am getting." Notwithstanding these and similar sundry remarks that are often heard, the fact is very clear that an honest workman will try just as hard to render valuable and efficient service and perform a good day's work when paid \$2 a day as when he receives \$3 a day. In his estimation the question of the amount of pay he will receive does not determine the quantity or quality of the work or service to be rendered.

When a man accepts employment at a specified rate of pay, he tacitly agrees to give the best service of which he is capable in return for the wages he expects to receive. The contract is made in good faith and does not permit an employee to argue that he would work harder or render better service if paid a higher wage. He is in duty bound to give the best service of which he is capable, as this is the natural expectation of his employer, and anything less would be robbing the latter of his rights.

THREE ESSENTIALS IN EMPLOYMENT

In the employment and management of men, I believe there are a few important factors that every employee should be made to understand are necessary. These are: Honesty, sobriety and regularity. A premium should be placed on these essentials by every employer and employee alike.

A man who is strictly honest in his dealings with his fellowmen will perform an honest day's work and give nothing less than the best that is in him. He can be depended upon for a truthful statement. Nothing interferes so much with good work in a mine as untruthfulness. The mule driver who accepts a small bribe from one

miner and gives him a better turn of cars than the man working in an adjoining room does an irreparable injury to the latter when he explains to the foreman that the second man could not load his cars when he had them.

Sobriety is an essential quality of every mine worker. Only when a man leaves drink entirely alone can he retain the full possession of his faculties and be in a position to protect himself and others from the dangers encountered in the mine. The man who spends a portion of the night in carousing finds himself in no condition for work in the morning, and it is impossible for such a man to render adequate service or perform a good day's work.

The irregularity of an employee affects not only himself but others, by disarranging the work in the mine. If a miner is not in his place, his room is idle and no coal is loaded there for the day. A few idle rooms seriously reduce the output of the mine. A trackman, timberman, or other shift hand will often be away when he is most needed and the work in the mine is hampered thereby.

Like Mr. Rose, I am not an advocate of small wages. Neither do I suggest the payment of higher wages as an incentive to more or better work. Experience teaches that good workmen will do the same work regardless of the price paid them, while an unreliable man will shirk his work regardless of the pay he receives.

Under the present wage-scale system, many men are paid \$2 a day when their work should receive a higher compensation. On the other hand, there are men receiving the same wages whose labor, but for the scale price, would not demand more than \$1 a day. For this reason, the best plan to pursue is to strive to eliminate, as far as possible, the idler. The man who aims to do no more work than that for which he is paid will generally be paid for no more than what he performs. This is an old maxim that was more applicable before the wage-scale system came into use than it is now.

U. S. WILSON.

Briceville, Tenn.

Letter No. 3—An interesting phase of this subject is suggested by the reference to the socialistic principle, "Equal wage for equal work," made by John Rose, in his letter, *Coal Age*, Oct. 14, p. 650. Mr. Rose remarks, very truly, that if this and similar precepts were to be adopted, "there would have to be some considerable readjustment, not only of the wages paid to the men, but likewise of the salaries paid to the officials." In my opinion the readjustment he mentions would nowhere be greater than with the office staff and salaried officials. It may be a delicate question, but when the equal rights of men are considered it is one that needs a thorough overhauling, such as I hope it will receive in this discussion in *Coal Age*.

In respect to the equality of compensation for labor, there is no comparison possible between the ordinary coal miner and other mine workers and the office force employed to keep the accounts of the work performed and the supplies needed in the mine. Almost without exception the office force of a large colliery is ridiculously small. The work required to make up each pay is a nightmare to these men, who must often work till midnight and be at the desk again at 7 o'clock the next morning, while no extra allowance is made for overtime. The mine worker enters the mine at 6 o'clock and goes home again about 3 or 4 o'clock, while the office man works

from whistle to whistle, and is fortunate if he does not have to return to his desk after supper to keep up with his work.

In this regard coal mining is no exception, as the same conditions prevail in almost every industry. It will occasion no surprise when one learns that the pay for this overwork is small, while at the same time most of the office clerks are referred to as being "indispensable." The recent investigations of the English tribunals charged with the task of settling the appeals against the liability of men to join the English Army, have brought to light more than one interesting incident which illustrates the contemptible attitude of many employers toward these overworked and underpaid employees.

"INDISPENSABLE" EMPLOYEES OFTEN UNDERPAID

In one instance, recently, a member of an English firm appeared before the local tribunal, for the purpose of registering his appeal against the taking of his chief clerk from him for service in the army. The appeal stated that this clerk "was indispensable to the business, which would be seriously handicapped without him." It was further explained that, "as secretary to the company, he handled funds amounting to more than \$250,000 a year." When considering this appeal the court asked the pertinent question as to what amount was paid the man for his services, and the response came that he was paid at the rate of 35s. a week, or, approximately, \$443 per year—and this to an "indispensable" employee! A number of similar cases developed at the same time, so much so that the local papers were moved to make some sarcastic comments on the justice of the pay this class of labor received.

When I began my colliery work, I used often to assist the clerks in the office at night and, I can say, their wages ranged from \$250 to \$300 a year. At the same time, they were handling the accounts of many miners and underground toilers who were making \$3.50 a day, while contract workers frequently made double this amount. As a result, most of the clerks gravitated into the mine.

OVERWORK NOT UNCOMMON IN MINE OFFICE

While it may be claimed that these are extreme cases, I have found that they are by no means uncommon. No one will attempt to say that these office workers are paid for their work on an equal basis with the toilers underground, even allowing that there are risks and dangers incurred in the latter case that demand a higher wage scale for the worker.

There would appear to be more equity possible in the application of the slogan "equal wage for equal work" to workers in the mine than to the force employed in the office, for the reason that the former can organize to protect their rights, while the organization of office clerks is practically out of the question, owing largely to their generally higher education, which operates as a drawback to the use of such measures. The average miner, however, is not troubled with any such scruples. It is to be hoped that such a state of affairs will appeal to mine managements in a manner that they will come to recognize the faithful and prolonged service of this class of their employees and endeavor to alleviate their condition whenever the work overwhelms the worker.

J. B.

Sydney, N. S.

Certification of Mine Foremen

Letter No. 11—I am a strong advocate of continuing the examination of candidates for mine foremanship along the old lines, in respect to the kind of questions asked. Having passed two examinations for first-class certificates in Canada and two in the United States, I feel that there is no part of the examination that is indispensable to determining a successful mine foreman. In the provinces of British Columbia and Alberta, Canada, the examination for mine manager (mine foreman) covers the subjects of the Coal Mines' Act, mine gases, ventilation, practical work, mine machinery, surveying and leveling. When a candidate is able to answer questions in these general subjects he will have something, in addition to his practical experience, on which he can rely and which will give him a feeling of security and confidence in his work.

The more theory that is required in the examination of candidates for mine-foremen and fireboss certificates, the better will the successful candidate be prepared to meet the problems that arise in the mine. Neither a mine foreman nor a fireboss can know too much of the chemistry of mine gases and the laws governing the flow of air through mine airways. The knowledge will enable him to plan and carry out his work successfully.

MINE FOREMAN MUST CONTINUE TO STUDY

The foreman who consigns his books to the shelf the moment he has passed the examination will never make much advancement. It is necessary today that mine foremen continue to study. I believe in periodical examinations for all mine officials, at least, till they reach the age of 55 years, when they might be exempt. Such a system of periodic examination would keep men studying and prevent them from laying aside their books when they have obtained their certificates.

All certificates, in my opinion, should be subject to cancellation should it be shown that its possessor has not kept up to the required mark of efficiency. This would also have the effect to keep men studying and reading to improve themselves. Every mine foreman should have an ambition to qualify himself for a higher position. He should aim to become a superintendent or even general manager. When a man's ambition ends in securing a mine foreman's position it is safe to say that he will not make a very zealous and efficient foreman. It is impossible for a truly efficient man to stand still and cease to strive for something higher.

In my opinion it is not too much to require that candidates shall have had at least two years' experience in the actual work of mining coal at the face, before they are eligible to take the examination. Also, men should be required to have had at least five years' experience underground before being permitted to assume charge of a dusty and gaseous mine.

I was much interested in the suggestion of a practical examination of candidates similar to that conducted in the Bruceton mine by the examining board of the 17th Bituminous District of Pennsylvania, described in *Coal Age*, Sept. 16, p. 461. While I am unable, at the present time, to suggest a way in which such an examination could be conducted by examining boards in other districts, the suggestion appeals to me as a practical one and worthy of the most careful consideration.

South Bethlehem, Penn.

J. W. POWELL.

Draining Shafts by Boreholes

Letter No. 1—Reading the interesting article by E. B. Wilson, *Coal Age*, Sept. 23, p. 493, in which he describes what was probably the first large drillhole sunk in the anthracite field of Pennsylvania, has suggested to my mind the possibility of draining a shaft during the period of sinking by means of a borehole sunk a few feet outside of the shaft excavation. In my opinion such an expedient might prove of great advantage in keeping a shaft clear of the sinking pumps that would otherwise be required, and avoid the annoyance of the exhaust when these pumps are operated by steam.

The borehole should be sunk to the full depth of the finished shaft and should be of sufficient size to permit a deep-well pump to be lowered into the hole. Then, by means of horizontal driftholes connecting the bottom of the excavation with this borehole, the water made in the shaft would drain into the hole, from which it would be pumped to the surface. This would keep the shaft practically dry during the entire period of sinking, and the expense of the short driftholes, which it would be necessary to bore from time to time, would be small indeed.

In addition to this suggestion I want to ask if it would not be well, also, to sink a drillhole in each of the four corners of a shaft before starting the excavation. Would not this method assist in keeping the alignment of the shaft true? This idea occurred to me when in charge of the sinking of two shafts in Texas, but I have never seen or heard of its having been tried. The drilling could generally be done for about 40c. a foot. I would like to hear from others on each of these propositions.

Briceville, Tenn.

W. M. SHUTT.

Merit vs. Favoritism in Gaining Promotion in Mining

Letter No. 7—This is a many-sided question, and better results will be obtained in its discussion by viewing it from different standpoints. "Pennsylvania Reader," *Coal Age*, June 3, p. 954, appears considerably wrought up by what he criticizes as a "lack of policy," when a company seeks outside men to fill vacancies in higher positions and ignores the length of service of its own employees. This is looking at one side of the question only.

What might appear to be a disregard of the claims of employees proves to be only a judicious business act on the part of a wise management, when viewed from that standpoint. To illustrate this: Let us assume an extensive mining operation that employs a large number of men, many of whom have been with the company a number of years.

The management find to their dismay that certain new methods are being adopted in competitive districts which enable the coal to be mined at a greatly reduced cost. In order to meet the close competition in the market, they realize that their system of mining must be altered to meet these conditions. A careful study of the situation shows that their own men have long been trained by the same leaders, and naturally think alike and see and do things alike—all traveling in the same old rut.

To overcome this impediment, it is decided to go outside and bring in a man of new ideas—one who is familiar with the new methods and can place the mine on a more even basis with their competitors. A wholly unprejudiced judg-

ment will not call this action on the part of the company a disregard of their own employees. It is, in truth, a high regard of their welfare in recognizing what is needed to make the mine a paying proposition.

The mere fact that a man has been long in the service of a company is not of itself sufficient ground for his promotion. Indeed, it may be good reason for retaining the man in his present position, where he may have developed a high degree of efficiency through long familiarity with the duties of his position. A man who is a success in one capacity may prove a complete failure in another. Here again a wise management must decide what is for the best interests of all.

For the sake of illustration, suppose several miners have been in the employ of a company for a number of years and have proved to be good miners. A more recent employee has not only proved to be a good miner, but has shown that he has certain qualifications that the other men do not possess. More than once, as opportunity offered, he has shown a wise judgment and an ability to plan his work. It is clear that he is a leader among his fellows and these qualities, it must be conceded, fit him for the position of mine foreman in preference to employees of longer service who desire the promotion but have not the same fitness. The advancement of such a man is a recognition of his merit and cannot be considered as "favoritism" on the part of the management.

PROMOTION GAINED BY CONTINUED EFFORT

In this connection, permit me to add that places of trust and responsibility are not attained without exertion. Aspiring young men should be taught that the first requisite is to fit themselves by study and training for the positions they desire. There is no short cut to education. Knowledge is gained by hard study, and experience by hours of toil. The capability of men to get results is the chief factor in promotion, and length of service decides only when other things are equal.

As suggested by Ostel Bullock, in his letter, Sept. 9, p. 437, some men want everything and are always dissatisfied. "If they had the world, they would want the sun, moon and stars also." There are some men who are always envious of another's ability and success, while they make little effort to equip themselves for like success. When these see a fellow worker promoted, they are quick to cry "preferment" and "favoritism."

In closing, I want to denounce the tendency of many parents to seek other employment for their sons than that which has been the means of their own livelihood. Every candid mind will agree that it is a mistake to choose preferment to a high position, for which the aspirant has not prepared himself by study, toil and training. I regret to say that the tendency of many young men today is to pass by the hard-training grounds that alone can fit them for the greatest usefulness and highest success in life.

However, I do not want to be understood as holding the opinion that there is no favoritism shown in mining promotions. I am sorry to admit that too often this is the case. Nevertheless, I do believe that the charge of favoritism is often made where the promotion was simply due to the exercise of a wise judgment and a comprehensive grasp of the existing conditions, together with a penetrating insight and knowledge of human nature.

JOHN ROSE,

Dayton, Tenn.

Former District Mine Inspector.

Inquiries of General Interest

Water-Gage Readings in Fan Ventilation

(Concluded from last issue)

Replying further to the question regarding the pressure or water gage that a centrifugal fan will develop, asked by a correspondent in our last issue, we repeat that it is the resisting power of the mine, or "mine potential," that determines the actual pressure or water gage in fan ventilation. Whatever the dimensions or speed of a fan, it cannot produce a greater water gage than what is determined by the resisting power of the mine or airway on which it operates.

This statement becomes clearer when we remember that the power on the air (ft.-lb. per min.) in the fan drift, which is a certain fraction of the power applied to the fan shaft dependent on the efficiency of the ventilator, is expressed by the product of the unit pressure (lb. per sq.ft.) and the quantity of air circulated (cu.ft. per min.), as expressed by the formula

$$u = Q p$$

The power producing a circulation is therefore the determining factor, while both pressure and quantity are resultant factors, and these latter vary inversely as each other, for a constant power on the air. That is to say, the power remaining constant, the pressure increases as the quantity of air in circulation decreases, and vice versa. Thus, for a constant power on the air, a mine resistance that will reduce the quantity one-half will double the pressure. Or, a less resistance that will permit twice the quantity of air to pass can produce but one-half the pressure. It is therefore quite clear that, for any given power producing circulation, the pressure or water gage is dependent on the quantity of air in circulation.

But, again, for a constant power on the air (u), the quantity (Q) in circulation is determined by the resisting power of the mine, which is expressed by relation of the sectional area (a) of the airway to its rubbing surface (s), or the area of passage in a mine to the total rubbing surface of the mine airways, as shown by the formula,

$$u = \frac{k s Q^3}{a^3}$$

Then, since when the power is constant both u and k are constant, it is evident that

$$Q \text{ varies as } \frac{a}{\sqrt[3]{s}}$$

Hence, the resisting power of an airway, or its potential factor, is expressed by the ratio of the sectional area to the cube root of the rubbing surface. This potential factor must always be taken into consideration when calculating the pressure or water gage that a given fan will produce at a given speed.

In answer to the question as to whether the location of the water gage should be stated, telling where the reading was taken, we would say that, in deep shafts or shafts having a restricted area, it is important to consider the shaft resistance; but, in general, the reading taken at the

shaft bottom, between the main intake and return airways, will differ from that taken on the fan drift by an inappreciable amount, provided the cages or other obstructions do not seriously interfere with the passage of the air current. While the gage reading at the shaft bottom represents the mine resistance only, that taken on the fan drift includes the shaft resistances, both downcast and upcast. In the estimation of ventilating power it is always safer to take the water-gage reading on the fan drift.

From what has been stated thus far, it should be evident that the claim that "the same speed of the fan will produce the same water gage whether the air is passing through the mine or is short-circuited at the foot of the shaft" is incorrect and cannot be proved in mine practice. As a fact, the short-circuiting of the air at the bottom of the shaft cuts out the mine resistance and, assuming a constant power on the air, the quantity passing through the fan is greatly increased, which increases the resistance within the fan itself and the power absorbed by that resistance. The result is that there is a heavier load thrown on the fan despite the fall in pressure, and the fan will naturally run slower under these conditions. It is a common mistake to assume that when the air is thus short-circuited at the shaft bottom the fan will increase its speed under the same power applied to the fan shaft, but this is not the case.

The suggested lengthening of the airways, in the development of a mine, increases its resisting power, with the result that a less quantity of air is circulated under a greater pressure or water gage. Therefore, in order to maintain the same circulation under these conditions, it is necessary to speed up the fan, which will require an increase of the power applied to the fan shaft. In other words, to maintain the same circulation of air against the increased pressure or water gage requires an increased power.

Yes, it is possible "to increase the distance the air must travel so as to [practically] absorb the pressure created by the fan." Such a condition would represent a high pressure and a correspondingly small quantity of air passing. The increase of water gage would be shown on the fan drift, whether the fan is blowing or exhausting. The water gage on the fan drift indicates the pressure producing the circulation and not, as suggested by the inquiry, the pressure on the intake when the fan is exhausting. The latter pressure would, of course, be decreased when the length of the airways is increased.

Finally, considering "a governed fan running at a constant speed," as suggested in the inquiry, the effect of increasing the length of air travel in the mine to a practical limit would be to stifle the fan, thereby causing nearly a static gage approaching that which would be produced by closing the fan drift to the passage of air. The static gage of a fan can be estimated approximately by multiplying the working gage by the ratio of the force of gravity expressed in feet per second, to the velocity of the fan drift under working conditions, also expressed in feet per second.

Examination Questions

Alabama Mining Examination, First-Class, July 24-27, 1916

(Selected Questions)

Ques.—Give the names of and describe the kinds of power used to produce the different kinds of ventilation.

Ans.—The several kinds of mine ventilation, in respect to the power producing the circulation, are: Natural, furnace and mechanical ventilation. Natural ventilation may be produced by the pressure of surface winds directed into the mine by means of a cowl. Or, under favorable conditions allowing of the natural drainage of the mine, a current of air can be produced by means of water falling in a shaft. The more common form of natural ventilation, however, is that which is caused by the natural heat of the mine causing an air column in the shaft. The relative temperatures of the mine air and the outside atmosphere determine the direction of the air current in the mine.

Furnace ventilation is produced by the artificial heat imparted to the air in the furnace shaft by the coal burned in the furnace near the foot of the shaft. The furnace shaft is always the upcast, owing to its higher temperature.

Mechanical ventilation is produced by mechanical means, the most common method employed being the fan, of which there are two general types—the disk fan and the centrifugal fan. In the use of the disk fan, which consists of a number of vanes mounted on arms radiating from a central shaft, the air is propelled forward by the revolving vanes. In the centrifugal fan the air enters the fan at its central orifice and is forced out at its circumference by the centrifugal force developed by the revolution of the blades.

Ques.—Describe each kind of ventilation named in the answer to the previous question.

Ans.—There are two general systems embraced in natural, furnace and fan ventilation; namely, the blowing and the exhaust systems of ventilation. In the blowing system the mine is always ventilated under a pressure above that of the atmosphere. The air current, here, passes from the ventilator creating the pressure, through the mine airways, to the other opening where it is discharged into the atmosphere.

In the exhaust system of ventilation the mine is ventilated under a pressure below that of the atmosphere. In this case the ventilator, whatever form is employed, produces a depression in the fan drift, and the atmospheric pressure forces the outside air into the mine by reason of the lower mine pressure. The direction of the current in the latter of these two cases is the reverse of that in the former.

Ques.—Describe the continuous-current system of ventilation.

Ans.—A continuous current is that in which the air follows one continuous course throughout the entire mine, which is thus ventilated by a single current only.

Ques.—Describe the split-current system of ventilation.

Ans.—In this system of ventilation the air is divided into two or more separate splits or currents. This division may take place at or near the bottom of the shaft or at any point in the main intake airway or in the mine. From such point of division each split of air pursues its own course through the mine, until they again unite at some point in the main return airway.

Ques.—What are the advantages and disadvantages of the continuous-current system?

Ans.—Practically, the only advantage in ventilating a mine by a single current of air is that it avoids the necessity of constructing air crossings—either undercasts or overcasts—which are always required where the air is split into separate currents.

One of the chief disadvantages of a continuous current is that it necessitates the erection of doors on the main haulage roads, in order to deflect the current into the cross-entries. In this system, also, the return air from one district or section of the mine passes directly into another district, and from that to another, and so on throughout the mine. The last districts are thus ventilated with very impure air. If gas is generated in one district it is carried through all the other districts on its way out of the mine, greatly increasing the danger of ignition and explosion. Finally, a high pressure or water gage is required to supply an adequate amount of air circulated in a single current throughout the mine. A high water gage means a greater consumption of power for the same quantity of air circulated.

Ques.—What are the advantages and disadvantages of the split-current system?

Ans.—Practically, the only disadvantage of splitting the air current passing in a mine is the necessity of building air bridges, which are generally required for each separate air split.

The advantages of this system of ventilation are: The avoidance of doors on the main roads; the supplying of fresh air to each section of the mine; any gas generated in one section or district is carried directly into the main return by which it passes out of the mine without contaminating the air in the other districts; there is less danger of ignition of gas and explosions; and, finally, a larger quantity of air can be circulated by the same power, or less power is required to produce a given circulation in the mine when the air is divided into two or more splits.

Ques.—If the volume of gas in a return air current of 20,000 cu.ft. per min. is 3 per cent. how many cubic feet of marsh gas does this current contain?

Ans.—The volume of gas in this current is
 $20,000 \times 0.03 = 600 \text{ cu.ft. per min.}$

Ques.—Do you prefer the continuous or the split-current system, and why?

Ans.—The split system is always to be preferred in mine ventilation, for the reasons mentioned in the answers to the two preceding questions. The operation of the mine is rendered more healthful and safe, and the cost of ventilation reduced by splitting the air current.

Coal and Coke News

Washington, D. C.

During the past week the National Association of Railway Commissioners, holding their 29th annual convention, took formal cognizance of the coal shortage and the resultant curtailment of coal shipments. The association authorized the appointment of a special committee to work out a solution of the present difficulty and to appeal to Congress for additional legislation whereby the Interstate Commerce Commission will be clothed with ample authority to prevent the occurrence of such a situation again.

The National Association of Railway Commissioners is composed of the members of the Interstate Commerce Commission and the members of all state boards or commissions which are delegated the authority to regulate carriers within the various states. The association had not organized any special committee to take up the car-shortage situation, but in view of the evident crisis in this matter a number of its important members met informally at a local hotel during recesses of the convention and appointed Frank H. Funk, of Illinois, their spokesman. Mr. Funk presented the matter to the convention before it adjourned on Friday.

It is not anticipated here that this will be the last of the matter, inasmuch as a larger part of the state commissioners intend to remain in Washington for a week or more to present their views to Congress regarding legislation. The railroad problem is one of the most pressing domestic problems before the Wilson administration and there is a determined agitation on foot to have the matter brought to a conclusion this winter.

The resolution presented by Mr. Funk read as follows:

"Whereas, There now prevails throughout the United States a shortage of cars, unprecedented in proportions and stupendous in its possibilities of damage to the industries of the country; and while this stringency in transportation facilities is general over the country, it is particularly acute in the Central and Western States; to such an extent has the shortage developed that business in many lines is paralyzed and people in many states are menaced by a famine in fuel and food-stuffs; hundreds of thousands of bushels of grain in Iowa, Kansas, Nebraska and other states have been hauled to railway stations and dumped upon the ground for want of cars to move it to market; millions of dollars represented by this unmarketable product of the farms is jeopardized and the commercial equilibrium of the territory affected is imperiled; mines in Colorado and other states have been forced to suspend operations and industries dependent upon their product for fuel have been compelled to shut down or to seriously curtail their operations; perishable fruits and vegetables are being held in Western States with a prospect of partial and possible total loss; and

"Whereas, It appears from statistics recently made public by the American Railway Association that there were, for the 24-hr. period ending Nov. 1, 1916, 108,010 fewer cars in the United States than were required to transport shipments offered; and

"Whereas, It appears that the situation has reached such proportions that it has gotten beyond the control of the carriers themselves, as is evidenced by the recent action of the American Railway Association in naming a committee to confer with the Interstate Commerce Commission for the purpose of devising ways and means for enforcing the rules of the association regarding the return of foreign cars to their owners; and

"Whereas, The misuse and retention of cars by certain carriers has disturbed the transportation equilibrium in the country; and

"Whereas, Under the act to regulate commerce as now in force, the Interstate Commerce Commission appears to lack the necessary authority, except after hearing and consequent delay, to make rules and issue orders governing the proper return of equipment to the lines owning or leasing the same; therefore, be it

"Resolved, That a committee on car service and demurrage, consisting of seven members with full power to represent this association, be appointed by the president to confer with the Interstate Commerce Commission for the purpose of securing such immediate relief as is possible in this emergency; and be it further

"Resolved, That the said committee on car service and demurrage be instructed to present these resolutions to the Congress of the United States and to urge upon that body the adoption of an amendment to the act to regulate commerce which will confer upon the Interstate Commerce Commission authority to establish rules and regulations with respect to exchange, interchange and

return of equipment between the various railroads operating in the United States; and be it further

"Resolved, That it is the sense of this association that one of the principal reasons for the car shortage in many sections of this country is failure of certain of the carriers to promptly return the equipment which has been unloaded at points on their lines to the road owning the same; and further that this inconvenience and financial loss now being suffered by many of the shippers would be materially reduced if all the carriers would immediately proceed to return the cars they are now using to the roads owning the same; and be it further

"Resolved, That it is the sense of this association that the Interstate Commerce Commission, in its consideration of the application of the carriers for an increased charge for demurrage, compare the relief to be gained thereby with the additional relief that might be afforded by a material increase in the per diem car rental charge assessed by the carriers in their interchange agreements."

Government May Refuse Minimum Price

A decision was rendered recently by the Court of Appeals of the District of Columbia holding that the Department of the Interior has authority to appraise coal lands in any section of the United States and that the Government is not compelled to sell coal land at the minimum price of from \$10 to \$20 an acre, as fixed by law. This decision is expected to result in a saving of more than \$500,000,000 to the Government. The decision was handed down by Justice Josiah A. Van Orsdel, in upholding a like decision rendered in the District Supreme Court.

The action was brought originally by Fred W. Handel and Mae Handel, of Montana, in a mandamus action to compel Secretary Lane, of the Interior Department, to accept the minimum figure for land in Montana appraised by Government appraisers at from \$72 to \$80 an acre. The plaintiffs asserted that they took possession of the land in 1907, when it was still unreserved, unsurveyed and unclassified. The land was surveyed in June, 1909, and was appraised at the higher values in 1910.

The Handels shortly afterward made application to purchase the land and paid the Land Office \$20 an acre. The Secretary of the Interior, however, refused the application.

HARRISBURG, PENN.

The 8-hr. day is the absolute limit for hoisting engineers at anthracite coal mines who are ever called upon to hoist or lower men and boys employed in the mine. This construction of the act of Apr. 29, 1911, has been handed to the chief of the Department of Mines, James E. Roderick, by Deputy Attorney General William M. Hargest.

Section 1 of the act of 1911 reads as follows: "That on and after the passage of this act, no person engaged as hoisting engineer at or about the anthracite coal mines of this commonwealth, part of whose duties it is to lower men and boys into, and hoist them and coal from, the said mines, shall be engaged for a longer period than 8 hr. out of each day of 24 hr.

"It is not necessary that the engineer handle men and boys each day in order to get the 8-hr. day. The safety of the employees ascending or descending in the cage is the first consideration; the engineer must be in fit shape to handle them.

"It would do violence to the intention of the law," rules Mr. Hargest, "to say that an engineer who was engaged in hoisting coal only might work 15 hr.; but if he were engaged the next day in lowering men and boys, and also hoisting them and coal, he could then only work 8 hr. The 15-hr. service on the previous day might entirely unfit him to perform the 8-hr. service in a way to protect the persons and the property which he was required to lower or hoist."

If the hoisting engineer's work is limited to handling coal, and he never handles men and boys, "the statute is not violated, if he remains at work longer than 8 hr."

The 1915 Tax Is a Dead Letter

Discussion among state officials interested in increasing the revenues of Pennsylvania so that it can never happen again that the school payments must be delayed because of a shortage of state treasury funds, has brought out the fact apparently that no coal tax is to be collected under the 1915 act. So far as action on the part of the state is concerned the 1915 act is as dead a letter as the anthracite coal tax law of 1913, which was declared unconstitutional by the Supreme Court.

A state commission appointed by Governor Brumbaugh a few months ago is now at work trying to solve the question of what shall be done with the money collected. Auditor General

Powell, unwilling to run risks, had escheats filed so that if the money is not returned to the consumers the state will get it, if possible.

The 1915 anthracite tax law was so framed, it was thought, that the faulty features of the prior law would not invalidate it. It provides the same rate of tax, and under its provisions the coal companies should have started filing their reports with the auditor general with the beginning of the present year. Attorney General Brown, however, when the time for filing of the reports arrived, notified the auditor general that he would advise him regarding the matter. This advice, it is said, has not yet been given. No reports have been filed and no attempt has been made to collect any of the tax.

While the state officials interested will not say the 1915 act is as defective constitutionally as is the act of 1913, it is generally believed by lawyers that the newer act is no better from a legal standpoint than the 1913 act. So far, the coal companies have not attacked the law, and it is conceded in some quarters that they will not do so.

Some of the officials at the capitol, who do not care to be quoted, as their opinion on the matter will probably be asked by the governor, are of the belief that there never will be any state tax collected on anthracite in Pennsylvania until there is a general law relating to bituminous coal, oil and natural gas. Efforts to put through such a measure have been under way ever since Governor Tener's tax commission made numerous recommendations four years ago on means of increasing the revenues. This state, Ohio and West Virginia have never been able to come to an understanding regarding a tax on soft coal, oil and gas. For this reason it has been deemed not advisable to tax natural resources of western Pennsylvania which are found also in adjoining states.

One way out of this, though, is suggested by a state official here. He believes that the general tax law could be passed with a provision made for an exemption for soft coal, gas and oil until Ohio and West Virginia decide upon a law placing a similar tax on these commodities.

Freight Rate Reduction To Be Settled

One of the big obstacles which has held up for two years the order of the Pennsylvania Public Service Commission decreasing freight rates on anthracite coal to Philadelphia by 40c. a ton has at last been removed. After more than a year of delay, due to lost exhibits, the Pennsylvania Railroad Co. has finally printed the record of the hearing in the case, which started in Philadelphia three years ago and continued at intervals for nearly a year.

Advance copies of the record are now in the hands of William N. Trinkle, recently retained by Attorney General Francis Shunk Brown to push the case to final hearing before the Dauphin County Court in this city. Mr. Trinkle expects to be ready to report to the attorney general and to argue against the appeal of the railroads within 30 days.

The attack on hard coal rates was started before the old state railroad commission, which had power only to recommend any changes in rates or other matters shown to be necessary in its hearings. Just before the conclusion of the fight the railroad commission was displaced, under the act of the assembly, by the present Public Service Commission, with authority to order decrease in rates shown to be excessive or discriminatory.

The present commission handed down its opinion in December, 1914, and with it an order cutting the rates from the three Pennsylvania anthracite fields to Philadelphia by 40c. a ton. Appeal to the Dauphin County Court was taken in January of 1915 by the railroads.

A bond of \$800,000 was provided by the railroads, and since that time no action was taken until about a month ago, when Attorney General Brown intervened.

PENNSYLVANIA

Anthracite

Hazleton—Miners in the Lehigh region assert they have solved the high-cost-of-living problem through their decision to go back to gardening and keeping cows and pigs. There is plenty of spare land in colliery villages, and some men have already obtained two acres each which they will fence this fall and till next spring. They will put up barns for their cows. Potatoes, corn, cabbage, beets and other edibles will be raised and the cattle will browse on the brush. The 8-hr. day gives them much more daylight freedom and they declare the back-to-the-soil move is one which will work out successfully.

Shenandoah—Six collieries operated by the Philadelphia & Reading Coal and Iron Co. in this

vicinity were recently compelled to close down on account of a shortage of cars. Several thousand miners were rendered idle by the shut-down.

Bituminous

Holsopple—Several men interested in the Victor Coal Co., of Holsopple, have purchased the Roudabush mine and organized a new company known as the Benson Coal Co. This is capitalized at \$10,000. The Roudabush mine is near the opening of the Victor Coal Co., and the coal will be handled over the tipples of the Victor plant. Heretofore the Roudabush mine produced custom coal only, but the new company intends shipping the product.

Windber—The sum of \$500 in prizes for best appearing and best kept properties was distributed a few days ago by the Berwind-White Coal Mining Co. among its employees.

Johnstown—Mines in Cambria, Blair and Clearfield counties have been put out of commission at various times recently by interruptions in the current of the Penn Central Light and Power Co., due to accidents at the power plant. The company, however, is installing a new 4,000 kw. generator at the Warrior Mark plant and will double the capacity of the Williamsburg plant, so that these delays will be eliminated.

The old Llewellyn mine, in the courts for several years and recently acquired by R. J. Wentz, formerly of Holsopple, Somerset County, will begin shipping coal within a few days.

With only the output of a little more than six weeks to be added to the total, local mining men are predicting that the tonnage in the sixth bituminous district will be almost two million tons less than last year. It is also expected that the 24th district will fall short of last year's record.

Indiana—The Penn Mary Coal Co. has leased a tract of 200 acres of coal to B. R. Williams and H. S. Griffith, near Pine Flats, Indiana County. The tipples are completed and the railroad siding on the Cambria & Indiana R.R. almost ready. Shipping of coal will begin in a week or two.

Greensburg—While searching for a man believed to have been lost in a mine of the Jamison Coal and Coke Co., William Kirkley, aged 31, a mine foreman, was overcome by gas and was dead when rescuers found him on Nov. 15. The man had been sent into the mine to make some repairs, and when he failed to return Kirkley went to find him. When Kirkley failed to return, a rescue party entered and found the foreman's body in an abandoned working which had become gaseous. An investigation showed that the man the foreman had attempted to save left the mine before Kirkley entered.

WEST VIRGINIA

Charleston—Coal carriers operating in West Virginia have notified coal operators that coal for shipment to Lake ports can be loaded until Nov. 28, in view of the extension of time to Dec. 8 for the delivery of coal cargoes at lower Lake ports. It is estimated that Lake shipments are about 20 per cent. behind, and the business will be rushed during the brief remaining period.

Triadelphia—The work of sinking a coal shaft by the Pittsburgh Consolidated Coal Co. has been started, and this work will be pushed to completion. A large number of new houses are to be erected in the various vacant strips of property in the town, and will be of modern pattern. The work of building these houses will also be started in the near future. The mine will be operated jointly with that at Elm Grove, and approximately 500 miners will be employed as soon as the mine is ready for operation.

Pemberton—The Leckie-Fire Creek Coal Co. and the Douglas Coal Co. located on the head waters of Piney Creek, 6 mi. from Pemberton, will begin shipping coal in the near future. These operations are among the best equipped in this section of the coal field.

Wellsburg—On account of the shortage of railroad cars, the West Virginia-Pittsburgh Coal Co. has made arrangements to load coal on the Ohio River at the La Belle mine. To accomplish this the construction of an incline to convey the coal to the boats on the river from the tipples has been begun. After these improvements have been made, the mine will be enabled to renew operations on a full-time basis.

Dry Branch—Fire in the mine of the Dry Branch Coal Co. recently assumed dangerous proportions. The blaze was not considered serious at first but an effort made to smother it failed and it spread to various rooms. All available help in the community was then summoned to assist in fighting the fire.

Baxter—Following a recent directors' meeting in Baltimore, the Monongahela Valley Traction Co. commenced the operation of the Stafford Coal Co. mine at this place. The stock of the coal company has been purchased, and the action of the board of directors in Baltimore was the consummation of the deal.

Fairmont—The recovery of the bodies of the three men killed in the Jamison mine No. 7 has been temporarily abandoned by the officials following the two recent explosions which almost completely wrecked the plant. It has been decided to seal up the openings to the shaft, and try to

smother or flood the fire before another attempt is made to enter the workings.

Clarksburg—The car supply on the Baltimore & Ohio R.R. has begun showing signs of improvement since Western lines have begun returning its equipment.

Slab Fork—The Slab Fork Coal Co. will shortly erect a clubhouse, amusement hall, etc., for the use of its employees. This building will be equipped with baths, reading rooms, etc.

Clay—The Hartland Colliery Co. developing and leasing coal lands on Meadow Creek has closed a deal for the erection of a central power station on its property for supplying its various leases. The West Virginia Engineering Co., of Charleston, is the engineer.

Ronda—The plant of the Coalburgh Colliery Co., almost entirely destroyed by the August flood, has been rebuilt and shipments will be resumed in a few days.

ALABAMA

Marvel—The Marvel mine which was the scene of an explosion a short time ago in which 18 men were killed, recently resumed operation. Owing to the damage done by the explosion, several weeks were required to get the mine in working condition and a large crew of men have been steadily at work cleaning up the debris, setting timbers, repairing brattices, and building tracks.

On account of the condition inside the Bessie mine of the Sloss-Sheffield company as a result of the explosion in that mine, the inspection and investigation of the cause of the explosion have not been started. It will probably require several weeks to put this mine back into condition.

Birmingham—The coal operators of the Walker County field have again taken up the matter of having the Federal government construct a lock and dam at Nichol's Shoals on the Locust Fork of the Warrior River, and also at Sander's Ferry on the Mulberry Fork of the river. Government engineers have made surveys for these proposed improvements, and it is estimated that these locks and dams can be constructed at a cost of approximately \$400,000. This development would afford water transportation facilities to the New Orleans and Mobile markets for 12 or 15 miles now in operation, and to virgin coal fields containing millions of tons, which would be developed to meet the requirements of the territory which would be opened up for Alabama coal as a logical result of cheaper freight rates. Congress will be urged to authorize these locks and dams at its next session.

KENTUCKY

Lexington—Consolidation of the College of Mines and Metallurgy with the College of Mechanical and Electrical Engineering of the University of Kentucky, will be recommended to the Executive Committee by President H. S. Barker.

Barbourville—Completion of the Cumberland & Manchester R.R., the 24-mi. coal- and timber-carrying line from Barbourville to Manchester, has been accomplished. A passenger schedule will be effective at once and equipment for freight is being received.

Owensboro—Charles Brady and other owners of the Fern Hill mines, near here, announce that J. H. Sowders, of Barbourville, Ky., having failed to appear and take possession under a recently executed contract of purchase, they will at once begin operation of the mines which have been closed for two months.

Earlington—W. G. Wright, of Carbondale, Ky., will take charge of the Coiltown, Ky., property and reopen the coal mine there. Many miners formerly living at Coiltown have returned there.

Pineville—Coal operators in the Bell and Harlan fields have posted notices at their mines to the effect that a bonus of 10 per cent. will be added to wages of all miners so long as the car shortage exists. The car shortage has reduced the output of the mines by about one-half. The arrangement is effective as of Nov. 1.

Harlan—The Harlan Improvement League is being organized here largely by coal operators and coal-mining men for the up-building and advancement of Harlan and her industries. The League will invite new people and new industries to locate in or near the town.

Whitesburg—Since the investigation into the coal-car shortage by the Interstate Commerce Commission, operators in the Elkhorn and Boone's Fork coal fields report considerable improvement with little interruption. The railroads entering the territory promise continued improvement until normal conditions have been reached. With high prices prevailing operators are experiencing a most favorable run of business.

With the large number of new companies getting ready for development work in the Letcher County coal field, the tonnage is to be largely increased—perhaps doubled—during the year 1917. With all this new work and increases of old operating companies it is believed that Letcher will lead in coal production any other county in the state. The present year's increase has been large.

Kona Station—(P. O. Mater)—W. H. Potter has purchased the Abram Potter coal-land tract on the headwaters of the Kentucky River and the newly organized Detroit-Elk Coal Co. will develop the new properties. This company will

also develop the W. H. Potter tract near Kona Station. The initial work is to begin at once.

Hazard—The coal fields around Hazard made a record run, loading 165 cars in one day on Friday, Nov. 17. With continued increases, operators believe that the output of the Hazard field will be almost doubled soon after the first of the new year. With improvement in the car supply there is much activity throughout most of the coal-mining centers of eastern Kentucky.

OHIO

Pomeroy—The Hysylvania Coal Co. has taken over the Silver Run mine, in Meigs County, owned personally by J. W. Blower, president of the company, and will start operations shortly. The mine has a capacity of about 400 tons daily.

Crooksville—The Kehota Mining Co., financed by Pittsburgh capitalists, will soon begin its operations between here and Redfield. The company has purchased a large area of farm land and will strip the surface, taking out the clay, coal and sand. A 300-ton electric shovel will be used to strip the land. This is one of the largest mining ventures undertaken in this section.

Athens—Car service during the past week to coal operators in this district has shown a marked improvement, according to John F. Courrier, superintendent of the bureau of rates and service of the Public Utilities Commission. The Toledo & Ohio Central reports 72 per cent. of cars placed. The cessation of ore shipments from Lake ports is expected to help in the near future.

Gallipolis—The Kanawha Coal Washery on the Ohio River recently resumed operations after being idle more than 3 years. Coal is brought from the Kanawha River in barges, washed and shipped to Lake ports.

St. Clairsville—The Provident mine is making only about half time because of the car shortage. When the proposed change in ownership is made it is expected that the Wheeling & Lake Erie will obtain more cars, thereby bettering work at the local mines.

INDIANA

Indianapolis—An investigation to determine what action, if any, can be taken by any of the state agencies, such as the Public Service Commission, toward relieving the coal shortage in Indiana was recently started by Governor Ralston. Many public utility companies are short of coal and are receiving their supply only a few hours before the stock on hand is exhausted.

Vincennes—Efforts are being made by citizens of Vincennes to prevail on the Chamber of Commerce to conduct an investigation into the coal prices. Lump coal is retailing here at 19 and 20c. a bu., while at Washington, Ind., the price is 10 and 11c.

ILLINOIS

Cantrall—The Cantrall Mining Co. is getting its mine here ready for operation. It has been closed several months. It is understood that the company's mercantile store and meat market will also be reopened.

Herrin—Ephraim Herrin, of this place, has conveyed title to 1,300 acres of undeveloped coal land in Williamson and Franklin Counties to H. Duggan, of Chicago. The consideration is said to have been in excess of \$150,000. Herrin has been accumulating the land for several years. Duggan is connected with the Johnson City Coal Co.

With the resumption of work at the Walnut Ridge mine, of the Taylor Coal Co., every mine in the vicinity of Herrin is now working and only three mines of Williamson County are idle. The Keystone mine, at Pittsburgh, will not be put in operation on account of the main shaft and bottom falling in.

Peoria—The special convention of the Illinois division of the United Mine Workers of America at a meeting here adopted a resolution addressed to President Wilson, asking a Federal investigation of high food prices, and suggested an embargo to prevent shipments of foodstuffs to foreign countries. Eighty-two thousand Illinois miners are represented.

Mt. Vernon—The Illinois Appellate Court here has affirmed the verdict of the Madison County Circuit Court in which a jury awarded John Wondzynski, of Glen Carbon, a coal miner, \$15,000 against the Madison Coal Corporation, of Chicago. He asked \$25,000 for the loss of both eyes on Oct. 20, 1913.

O'Fallon—The Ridge Prairie mine, which with the Taylor mine of the Joseph Taylor Coal Co., was recently sold by the receiver to the International Coal and Mining Co., of St. Louis, for \$30,000, and which is now being dismantled, is perhaps the oldest mine in central Illinois. It was sunk in 1857 and its continuous operation since has worn out several tipples, hoisting engines and shaft linings. For some years past it had a daily capacity of 800 tons.

OKLAHOMA

Coalgate—Settlement of the recent strike of coal miners and the reopening of the mines in this section, it is said will lead to the reopening of the coal mines of the Missouri, Kansas & Texas Railway Co. here, with the employment of about 500 miners. These mines have been closed for three years, chiefly due to labor conditions.

McAlester—Reports from various parts of Oklahoma, where there are coal mines that were shut down during the recent strike of coal miners, are to the effect that miners left the state while the strike was on and there is now a dearth of men to work the mines. Several large properties have not been able to resume operations because of this shortage of miners.

TEXAS

Wichita Falls—A test of Newcastle coal, mined near here, has been made, it is reported, to see if this coal will produce an artificial gas that can be used for lighting, heating and for industrial plants. The test proved unsatisfactory, it is announced, the coal showing little gas-producing properties.

Fort Worth—The Strawn Coal Co. of this city has moved its place of business to Strawn, near its mines, and has filed in the office of Secretary of State McKay, at Austin, an amendment to its charter making this change.

Personals

C. A. Graham recently accepted the position of chief engineer for the Elkhorn Coal and Coke Co.

A. J. Lafferty, superintendent of the Superior Colliery Co.'s mines, Wellston, Ohio, has resigned in order to retire to his farm. It is not known who will succeed to the position.

John C. Cosgrove, for a number of years president of the Hastings Coal and Coke Co., has resigned his position, to take effect Dec. 1. Mr. Cosgrove is affiliated with a number of other coal concerns.

R. L. Hancock, for many years sales manager for the former Western Anthracite Coal and Coke Co. of St. Louis, but more recently with W. S. Bogle, of Chicago, is now connected with the Aid Coal Co., of St. Louis.

Anton Denzer, superintendent of Glen Carbon for the Madison Coal Corporation of Chicago, has been appointed district superintendent of all the Madison mines at Glen Carbon, Divernon and those in the Mt. Olive district, succeeding George A. Simpson, deceased.

R. J. Foley has been appointed purchasing agent for the Don Coal Co., the Sharlow Coal Co., the Sekay Coal Co., the Madne Coal Co., the Bengal Coal Co., and the Federal Zinc and Lead Co. Mr. Foley has established offices in the First National Bank Bldg., of Huntington, W. Va.

William Reidelberger has entered the coal-jobbing field, with offices in the Central National Bank Building, St. Louis, Mo. He was for several years sales manager for the Joseph Taylor Coal Co. and for several months the receiver for some of the Taylor properties. These will pay 100c. on the dollar of indebtedness.

F. B. Gleason, formerly in charge of the Western Electric Co.'s business in the Far East, with headquarters at Tokio, Japan, has been appointed manager of the Southern district of this company, with headquarters at Atlanta, Ga. He will succeed E. J. Wallis, who on Jan. 1 will take up his new work as manager of the Pacific Coast district, with headquarters at San Francisco. Mr. Wallis will succeed F. H. Leggett, who, after three years on the coast, returns to the company's executive offices at 195 Broadway, New York City.

Obituary

Charles J. Roney, a former Pennsylvania representative and sponsor for the Roney anthracite tax bill, died suddenly of heart disease in a hospital in Philadelphia on Nov. 17. He was 32 years old and is survived by his widow and two children.

William J. Thomas, aged 74, the only survivor of the famous Diamond mine disaster in 1868, at Scranton, when 17 men fell to the bottom of the shaft, a distance of 190 ft., 13 of them being killed, died at his home in Hyde Park, Penn., recently, following an operation.

Hon. David MacKeen, lieutenant governor of Nova Scotia, pioneer of the coal and steel industries of the province, died at Maplewood near Halifax on Nov. 13 from the effects of a paralytic stroke. Mr. MacKeen, who was in his 78th year, was born at Nabou, N. S., and began his business career in the service of the Caledonia Coal and Railway Co., rising to the position of agent and treasurer and eventually acquiring a controlling interest. In 1893 the company was merged in the Dominion Coal Co., of which Mr. MacKeen was appointed general manager, resigning that position three years later. He took a prominent part in establishing the Dominion Iron and Steel Co. and was a director of the Dominion Steel Corporation and of several financial concerns. He took a keen interest in politics and in 1887 was elected as a conservative to the Canadian parliament, being appointed a member of the senate in 1896. In October, 1915, he was appointed lieutenant governor. Mr. MacKeen was married three times and leaves a widow, one daughter and three sons, two of whom are overseas with the Canadian forces.

Industrial News

Robindale, Penn.—A number of new houses are being erected for the Conemaugh Smokeless Coal Co. A school and store will also be built.

Pittsburgh, Penn.—William Domnich, of Pittsburgh, has established an office at 705 May Building, Pittsburgh, Penn., for the sale of mining specialties.

Philadelphia, Penn.—The Philadelphia & Reading Ry. is handling about 3,000 coal cars a day and has practically no car congestion to complain of at this time in the coal regions.

Central City, Penn.—The new branch road being built off the main line of the South Fork branch by the Lochrie coal interests, it is expected, will be opened to traffic on Jan. 1, 1917.

Bradford, Penn.—The Blaisdell Machinery Co. is building a 180-ft. extension to its machine shop and a 120-ft. extension to its foundry. These improvements are expected to be completed early in 1917.

Wheeling, W. Va.—A number of new coal fields will be opened by a branch line which the Baltimore & Ohio R.R. contemplates building between Wheeling and Waynesburg, Penn. A force of engineers is now at work surveying this route.

Danville, Ill.—This city, in the midst of one of the country's greatest coal fields, now has to pay \$5 a ton for coal that never before cost over \$2.50. No anthracite is obtainable, and dealers find the demand exceeds supply for bituminous.

Cresson, Penn.—The Pennsylvania Coal and Coke Corporation has awarded contracts for the erection of three modern new tipples. One of these will be at Patton, one at Beaverdale and another at a mining town in northern Clearfield County.

Harlan, Ky.—It is learned that the Harlan Commercial Club is making an effort, in conjunction with the Norton, Va., Board of Trade and other interests to induce the Norfolk & Western Ry. to extend its line from Norton, Va., into the Harlan, Ky., coal fields.

Pittsburgh, Penn.—The Norfolk & Western R.R. has lifted its coal-car embargo established against the Illinois Central because of the alleged failure of that road to return cars. It is stated that a satisfactory agreement between the two lines has now been reached.

Cleveland, Ohio—The City of Cleveland is contemplating the purchase of coal land as a safeguard against future coal famine. Lighting Commissioner W. E. Davis is back of the plan to purchase coal fields to supply the 700,000 tons used yearly by the city.

Birmingham, Ala.—The Southern Ry. has announced a voluntary increase of 10c. per ton on its contract price for fuel coal purchased in this district, effective Nov. 15. The Southern uses approximately 500,000 tons of Alabama coal yearly, the existing contracts expiring July 1, 1917.

Beckley, W. Va.—In the reorganization of the Price Wick and Lillebrook coal companies, these two properties have been combined under the general management of the Lillebrook company. The Price-Wick company will not be dissolved, but will take over a third tract, development of which will be begun at once.

Columbus, Ohio—The Heat, Power and Fuel Co. of Columbus, organized some time ago to develop a large stripping operation in Sullivan County, Indiana, is having trouble getting machinery delivered. The concern has ordered a large electrical shovel, which will be delivered and installed about the first of the year.

Landingville, Penn.—The large storage piles of anthracite near this town owned by the Philadelphia & Reading Coal and Iron Co. are rapidly diminishing. The plant is working double shift and 10,000 tons are shipped daily, which amount would be greatly increased if the proper number of cars could be secured at all times.

Covington, Ky.—John R. Boreling and others have brought suit in the United States Court here against W. T. Garrard and E. G. Garrard, the Kentucky River Timber and Coal Co. of New Jersey, to quiet the title to 90,000 acres of timber land in Lincoln County, Kentucky, along the Cumberland River.

Pocahontas, Va.—The Pocahontas Consolidated Collieries Co. is erecting a brick machine shop near the location of its old shop. When this shop is completed it will be one of the best buildings of the kind in the coal field. Twenty-eight new dwellings are also being erected by this firm at Boissevain and 60 dwellings at Jenkin Jones while five new dwellings are being built at Sagamore.

Philadelphia, Penn.—Local shipbuilding interests have been advised that the Panama Canal Commission will soon call for bids for two colliers similar to the "Achilles" and "Ulysses." An appropriation of \$1,500,000 is known to be available for this purpose. The vessels will be 514 ft. long, with a beam of 65 ft. The carrying capacity is to be 12,000 tons, with a speed of 14 knots.

Philadelphia, Penn.—There is an increasing demand here for vessels to load coal both for South American and European ports. Tenders are freely made for both time charters and at the per ton rate. The scarcity of unchartered steamers of all sizes available for delivery prior to Jan. 1 continues to operate against free chartering and tends to strengthen rates, especially to European destinations.

Fairmont, W. Va.—The two mines of the Consolidation Coal Co. at Interstate have been leased to the Elkhorn company, which has begun the work of putting the properties in operation. These two mines have been closed down for two years. Nearly all of the population of the town left when the mines closed. Other mines in the St. Clare region are now in full operation, and many of them will be fitted with mine scales at the tipple, so that the miners can be paid by weight.

Cincinnati, Ohio—The Halmor Coal and Mining Co. recently filed suit in the Common Pleas Court against the Procter Coal Co., of West Virginia, for alleged breach of contract to sell its entire output, said to be 10,000 tons a month, to the plaintiff at \$110 per ton for mine-run. It is alleged that the contract was repudiated by the Procter company on Nov. 5, and damages of \$100,000 are alleged and asked. Attachment and garnishment proceedings were initiated with the suit.

New York, N. Y.—The various investigations of Federal and state officials into existing coal conditions are being continued. Police Commissioner Woods has made public the results of inquiries made by the police during which time they quizzed 420 dealers. Of this number 28 refused any information and of the remaining 392, 316 said they had 10 tons each; 54 had from 10 to 75 tons each; 16 had from 100 to 400 tons; and six others had from 900 to 1,000 tons on hand each. According to the report the retailers had paid from \$7.25 to \$11 for their coal.

Philadelphia, Penn.—The Clark Bros. Coal Mining Co., with mines located on the Moshannon Branch of the Pennsylvania R.R. in Clearfield County, has been awarded \$31,127 by a jury in the U. S. District Court in its suit against the railroad company, in which it claimed discrimination in the distribution of cars. The suit was brought to enforce an award made by the Interstate Commerce Commission against the railroad company and is the third case in which the railroad has been ordered to pay damages recently.

Cincinnati, Ohio—The floating of three tows of coal down the river by the use of the Ohio River lock system as it now stands, to produce a "waving" process, occurred recently. The Campbell's Creek Coal Co. and the E. J. Hickey Transportation Co. handled the movement, which aggregated 3,500 tons. The barges were more lightly laden than usual and Government officials in charge of the dams released enough water to float the coal down. With the completion of dams Nos. 27 and 30 it is stated by river men that coal could be brought down the river to Cincinnati and below at any season, regardless of the otherwise normal stage.

Charleston, W. Va.—The New York Central Railroad Co., it was recently learned has authorized the construction of 20 ml. of railroad along the left bank of the Gauley River from Gauley Bridge. This will be an extension of the Kanawha & Michigan R.R., which now has its eastern terminus at Gauley Bridge. Rights-of-way for the road have already been secured and construction work will be begun at once. It will require more than a year to complete this extension. This line will reach Little Elk, where a connection will be made with a 4-mi. road that has been operated for several years by lumber interests along Gauley River. It is said that this will be the first of a number of extensions that will be added to the Kanawha & Michigan system to open coal and timber territory, throughout Nicholas, Greenbrier and other counties in West Virginia.

Columbus, Ohio—The Ohio Utilities Commission has issued an order compelling all railroads in Ohio to report at once all cars under load in the state, as well as unloaded cars, to ascertain if embargoes have been placed on other commodities than coal and to what extent coal cars are being diverted to other than coal-carrying purposes. The order was the result of a complaint from Akron to the effect that the Baltimore & Ohio had placed an embargo on coal entering that city until cars under load there were unloaded. The order of the commission opens up many lines of inquiry in connection with the investigation being carried on by the Interstate Commerce Commission. The Ohio commission is coöperating in the investigation with the Interstate Commerce Commission.

Covington, Ky.—The Camp Mining Co., operating the Ely mine in Knox County, Ky., has been named defendant in a suit filed here in the United States Court by the Logan Pocahontas Fuel Co., of Charleston, W. Va., in which the plaintiff charges violation of a contract and asks for an injunction. According to the petition the defendant contracted to supply the plaintiff with all the coal produced at the mine named, but took advantage of the prevailing high prices to sell in a "spot" market to high bidders. The court is asked to order issuance of a subpoena to show disposal of the coal produced at the mine and for an injunction to prevent the defendant from selling or billing coal loaded on cars to any other than the plaintiff.

Market Department

GENERAL REVIEW

Colder weather stimulates anthracite market but situation well in hand. Growing confidence that high prices on bituminous are here to stay. Twelve-month contracts negotiated at close to ruling prices in spot market. Lower temperatures force prices to still higher levels in the Middle West.

Anthracite—The lower temperatures have stiffened up the anthracite market very materially, but without creating a renewal of the very excited buying that marked the initial boom a few weeks ago. More coal is apparently being diverted to the Eastern markets in order to quiet the anxiety prevailing at the different points; as a result, the pressure has relaxed somewhat, though the dealers are moving a very heavy tonnage into consumers' bins, and are still crowding the shippers for all the coal they can get. While public sentiment is notably less anxious, the technical position of the market shows no improvement whatever. The reserve stocks of the big companies continue to disappear at an alarming rate while labor and car shortages are seriously interrupting production, and shipments for the current month will undoubtedly show a very substantial loss. The cessation of Lake shipments, now close at hand, is the only constructive factor in the whole situation, unless there should be an exceptionally mild winter that will materially reduce consumption.

Bituminous—The most significant feature of the soft coal trade is the growing conviction that the existing high prices are here to stay. The attitude of the producing interests and sales agencies is becoming steadily more confident, and their plans are being readjusted to conform with the new outlook. The reaction noted last week did not attain to serious proportions and much of the lost ground has been recovered. The expiration of a good line of contracts, as for instance, in bunker coal, is tending to force the issue as regards new prices; there is considerable hesitancy and backing and filling in the negotiations, but in every instance where contracts have been concluded, the prices named have been in accordance with the existing market conditions. In the meantime prices in the spot market continue most erratic, hinging very largely on the conditions of the sale, but with the general trend consistently upward. Much anxiety is felt over the general unrest in labor circles which was very much accentuated on the announcement of the increased wages by the U. S. Steel Corporation the current week; this affects more than a quarter of a million men, and makes a total increase of 33% for the employees during the current year.

Lake Markets—The recent weakness and subsequent uncertainty in this district have been entirely eliminated, and the market is as strong as ever. Steam demand is once more of the most urgent character, while a touch of real winter weather has created renewed interest in domestic coal. The increased demand for Middle Western coal in other markets has withdrawn considerable tonnage they were shipping into the central market, putting an increased burden on the mines in this section. That the market is firmly established at the prevailing high levels for some time to come, is evidenced by numerous annual contracts placed at close to ruling quotations as, for instance, the contract for furnishing the city of Cleveland with 45,000 tons of slack during the next 12 months, which was concluded at a figure slightly over twice as much as the expiring contract. The car and labor supply continue the dominating factors in the market. In spite of supreme efforts on the part of the transportation lines to improve conditions, they are scarcely holding their own.

Middle Western—Cold weather stimulated the market still further, and prices have once again advanced to new high levels. There is also a very urgent demand for steam coal, and it is clear that the situation on these grades is rapidly approaching a very critical stage, inadequate supplies and unheard of prices threatening to close down some manufacturing plants. Demand from outside sources continues to expand, and prices on this business are even above the ruling high level in the more local market. Not only is the volume of business to these markets increasing very appreciably, but new inquiries are constantly coming in, a very spirited demand for Illinois coal in Texas having recently developed, while inquiries are also being received from British Columbia. Retailers in the outlying districts, who have consistently stayed out of the market because of the ruling high prices, have suddenly started buying very heavily as a result of the colder weather.

A Year Ago—November anthracite tonnage about normal, but the month was a distinct disappointment in the trade. Bituminous improved, and little free coal available. Hampton Roads exports touch a new low point. Cold snaps counteract a slowing-up tendency in the Lake trade.

Comparative Average Coal Prices

The following table gives the range of mine prices in car lots per gross ton (except where otherwise noted) on 13 representative bituminous coals over the past several weeks and the average price of the whole group for each week:

| | Last Year | Nov. 25 | Nov. 18 | Nov. 11 | Nov. 4 | Oct. 28 |
|--|-------------|-------------|-------------|-------------|-------------|-------------|
| Boston | | | | | | |
| Clearfields..... | \$1.10@1.75 | \$4.75@6.00 | \$3.65@3.45 | \$3.50@4.25 | \$3.10@3.85 | \$3.00@3.75 |
| Cambrias and Somersets.. | 1.30@1.80 | 5.25@6.50 | 4.00@5.25 | 3.75@4.75 | 3.50@4.10 | 3.35@4.00 |
| Pocah. and New River ¹ .. | 3.65@3.83 | 9.00@10.00 | 8.50@9.50 | 8.50@9.00 | 6.25@7.25 | 6.75@7.00 |
| Philadelphia | | | | | | |
| Georges Creek..... | 1.75@1.85 | 6.50@7.00 | 7.00@7.25 | 7.00@7.25 | 4.75@5.00 | 3.45@3.65 |
| W. Va. Freeport..... | 1.25@1.30 | 5.00@5.50 | 6.25@6.50 | 6.25@6.50 | 4.25@4.40 | 3.15@3.25 |
| Fairmont Gas mine-run.. | 1.20@1.25 | 4.75@5.00 | 6.45@6.55 | 6.45@6.50 | 5.00@5.25 | 3.25@3.35 |
| Pittsburgh² | | | | | | |
| Mine-run..... | 1.15@1.20 | 4.75@5.00 | 4.75@5.25 | 5.00@6.00 | 4.50@5.50 | 4.00@4.25 |
| 3-in..... | 1.25@1.35 | 4.75@5.00 | 4.75@5.25 | 5.00@6.00 | 4.50@5.50 | 4.00@4.25 |
| 1 1/2-in..... | 1.35@1.45 | 4.75@5.00 | 4.75@5.25 | 5.00@6.00 | 4.50@5.50 | 4.00@4.25 |
| Slack..... | .85@0.95 | 4.50@4.75 | 3.75@4.25 | 4.50@5.50 | 4.00@4.50 | 3.50@4.50 |
| Chicago (Williamson and Franklin Co.)² | | | | | | |
| Lump..... | 1.65@1.75 | 3.50@4.50 | 3.50@4.00 | 3.00@4.50 | 3.00@3.25 | 3.00@3.25 |
| Mine-run..... | 1.10@1.15 | 3.50@4.00 | 3.25@3.75 | 2.50@2.75 | 2.00@2.75 | 2.00@2.75 |
| Screenings..... | .60@0.75 | 3.25@3.75 | 3.00@3.50 | 2.25@3.00 | 2.00@2.50 | 2.00@2.50 |

Gross average..... \$1.29@1.46 \$4.94@5.45 \$4.90@5.35 \$4.82@5.54 \$3.95@4.56 \$3.49@3.90

¹ On cars Boston and Providence. ² Per net ton.

BUSINESS OPINIONS

Iron Age—With a contract coke advance of \$2 a ton, and higher labor and supplies, pig-iron producers already see their cost at least \$5 a ton higher, beginning with May, 1917, a factor not to be overlooked in connection with the high-level prices for pig iron sold lately for the second half of next year. The pig-iron market has had another week of heavy buying and of rapidly mounting prices, foundry iron scoring the largest advances. Buyers are moved, not by an existing scarcity, and there is none of the excited buying for quick delivery that has marked all other rapid upturns. Fear of a scarcity next year is the impelling influence. Transactions have been large in both Northern and Southern irons.

The American Wool and Cotton Reporter—The last week has seen increased strength in the wool market. Shortages in wool are being felt more and more keenly each day. There is not so much activity because the supply is becoming more limited. The worsted mills are in urgent need of combing wools. Cables have been received stating that no combing wools will be allowed to be exported from Australia, although shipments of burry merino wools would be permitted after Nov. 20. There is difficulty in obtaining vessels in which to ship the wool.

Marshall Field & Co.—Wholesale dry goods distribution for the current week has been running well ahead of the corresponding period of a year ago. The volume of road orders for immediate delivery has been heavy in response to the more seasonable weather while road sales for future delivery have been much in excess of the week 1915. Buyers have attended the market in larger numbers. Collections are in excess of the same week last year. The market on domestic cotton goods is firm and advancing.

Bradstreet—Stimulating features are in the ascendant this week. Among these are widespread cold weather, with snow in the Northern States and freezing temperatures far to the south; new high-level prices for wheat, corn, oats, cotton, cottonseed, iron, steel and other metals; rampant speculation in industrial securities, and widespread advances in wages, mostly of industrial employees. Under these conditions it is no surprise to learn that retail trade has been active; that jobbers and wholesalers report continued pressure of demand, and that the chief complaint is still, as for some time past, the difficulty of obtaining merchandise in sufficient quantity to satisfy buyers.

Dun—The phenomenon of demand outstripping supply at the highest prices of modern times continues apparent in many lines. Competitive bidding and increasing costs of production steadily accentuate the strength of the leading commodities, and still further advances are foreshadowed by the eagerness of buyers to obtain urgently needed materials and products. As was to be expected, a certain hesitancy has developed in some quarters as a result of the extreme levels current, yet it becomes more evident that reluctance to sell is a greater influence in limiting new business than the rapidly rising prices. Commercial failures this week in the United States are 283 against 285 last week, 279 the preceding week and 387 the corresponding week last year.

Atlantic Seaboard

BOSTON

More consistent market. Pocahontas and New River prices strong and coal closely held for contract business. Bunker prices announced for 1917. Georges Creek deliveries very scarce. Market for Pennsylvania grades fast recovering from the recent sag. Anthracite dealers very short.

Bituminous—After several days of uncertainty the market has resumed the upward trend of early in the month, except that prices advance by shorter steps. Then, too, sales are less frequent and usually for smaller tonnages than was the case early in the month. This applies to coal yet to be loaded either at the mines or at the loading ports; coal in transit all-rail is still under the influence of the speculative consignments that had to be placed when prices slid off. There is much more confidence in present levels than a week ago and the market is that much more consistent.

Pocahontas and New River coals maintain their strong position. The great bulk of receipts is still being applied on contracts. While loading is subject to delays and shippers are conservative as to accepting boats it is noticeably easier for contractors to arrange for shipments. This, however, is due not so much to larger receipts as to a greater resolution on the part of shippers to meet current obligations. A few stray cargoes are being sold consumers in the coastwise trade and occasionally small tonnages change hands among the agencies, but \$7@7.50 continues the range of prices f.o.b. vessel.

There is perhaps less buying power for the Pennsylvania steam coals than two weeks ago, but the special situation is one that is hard to describe. An operator sees a chance of some free coal a few days ahead and he names his price; that price not being accepted, he sells a day or two later at a much lower figure, possibly \$1.25 less.

That is typical of this market, both at the mines and at Tidewater, and accounts for the wide range of prices. Much depends, too, upon the tonnage of any sale, as a price is possible for 200 tons that would be excessive for 2,000 tons. Such high levels have been reached that practically no operator is proof against them, and whether output is sold or not there is bound to be some "free" coal in almost every direction. All-rail trade has not yet recovered from the lower prices of ten days ago. The series of embargoes, again in effect, has a stiffening tendency and up to \$6.50 at the mines for fair grades of Cambria is again heard. Tidewater inquiry is not particularly active but prices are firm.

Bituminous at wholesale is quoted about as follows, f.o.b. loading ports at points designated per gross ton:

| | Clear- fields | Camb. & Som's't | Geo'gs. Creek* |
|---------------|------------------|--------------------|-------------------|
| Philad'l'a... | \$6.00@7.25 | \$6.50@7.75 | |
| New York.. | 6.50@7.50 | 6.75@8.00 | |
| Baltimore.. | | | |
| F.o.b. mines | 4.75@6.00 | 5.25@6.50 | |

*On contract.

Pocahontas and New River are quoted at \$7@7.50 f.o.b. Norfolk and Newport News, Va., for spot coal, and \$9@10 on cars Boston and Providence for inland delivery. Clearfields range from \$8.50 alongside Boston for spot cargoes to \$9.50 alongside Bangor.

Anthracite—An informal investigation here by the Federal District Attorney and the subsequent statement made to the press has somewhat allayed the excitement over the shortage of domestic sizes. The public has now been told plainly that if they do not rush in and buy in excess of their immediate needs, retail prices will probably not be advanced. It is partly a question of whether dealers are forced to buy independent coal at the prices ruling; if they do buy to any extent then \$9.50 delivered to the consumer will not be enough.

The weather is the biggest factor. Through the demand for barge tonnage in every direction and the scarcity of shipping the receipts here of egg, stove and chestnut are much lighter than usual. There are those who see no encouragement for 1917, because of the extent to which regular shippers have had their deliveries curtailed. A lot of chestnut was taken from storage plants between the mines and Tidewater in order to help meet the demand and now pea size is being similarly sent forward.

Prices alongside Boston are somewhat easier; \$10 was quoted recently for "independent" egg and chestnut.

PHILADELPHIA

Heavy demand for anthracite continues unabated. Retailers very busy, though there are no increased retail prices despite scarcity. Bituminous prices break sharply but partially recover. Rail movement at mines congested.

Anthracite—It has been a more peaceful week in the coal trade. It may be that the State Coal Commission, which held a three-day session here investigating prices, had a quieting effect upon the market, for certainly one hears less of high prices than for some time. However, the cold weather has kept the dealers very busy. Quite good shipments have been made into the city as the pressure seems to have let up somewhat from outside sources and we note occasional instances where a few extra cars are for sale to regular customers. Usually this coal is snapped up at the first offering.

The retail men are sending out heavy tonnages, as is indicated by the strong and persistent demand they make for increased supplies. Their cash business has undeniably improved and the laboring classes are buying in larger quantities. Unfortunately much of this buying is on pea coal, for which the retailer is paying an advance of at least 75c. over last winter's price and is receiving but 50c. more for it. Despite the difficulty in securing certain sizes of coal, none of the Philadelphia retailers are charging above the market prices for any size.

The mining conditions show little or no improvement and one of the largest companies is showing a decrease in tonnage of 8 per cent. or 9 per cent., due to labor shortage. This company had in its storage yards 1,900,000 tons November a year ago, and today has less than 500,000 tons. While it costs about 8 per cent. or 9 per cent. additional to store and reload coal, it is impossible to care for all of the markets of the big companies during the cold weather without it.

Of the sizes pea is the only one on which the dealers are comfortable and they cannot understand how the shippers can secure cars for it and not for stove coal, for which they are in such desperate need. Chestnut has not been as free as during the previous week and many are now running short. Stove remains the leading size and the cry for it never ceases. Dealers' bins remain empty for days at a time and shippers are fast becoming indifferent to the pleas for this size. If the local demand for egg was as great as for other sizes it, too, could not be supplied; the comparatively small tonnage sought is not coming out without long delays and with much complaining on the part of the consignee.

The demand for the steam coals continues unabated and the recent fluctuations in bituminous have in no way affected the anxiety of consumers to lay in as much anthracite as possible. Some of the larger companies have taken on quite a little additional business at the new figures, especially buckwheat at \$2. There also continues to be some little demand for culm by those plants who are able to use this by mixing it with bituminous. However, with the arrival of cold weather the shipments of culm will cease, as it practically freezes into a solid mass and cannot be handled then. The prices asked range from 50c. to 75c. a ton.

Collections continue to maintain their reputation of being the best in the history of the business.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for Tide are as follows:

| | Line Tide | | Line Tide |
|-------------|---------------|-------------|---------------|
| Broken..... | \$3.60 \$4.75 | Buck..... | \$2.00 \$2.90 |
| Egg..... | 4.15 5.25 | Rice..... | 1.25 2.15 |
| Stove..... | 4.10 5.60 | Boiler..... | 1.10 2.00 |
| Nut..... | 4.50 5.55 | Barley..... | 1.00 1.90 |
| Pea..... | 2.80 3.70 | | |

Bituminous—Early in the week prices of all grades broke sharply, the decline running from \$1.75@2 per ton, but just about the time some were predicting the collapse of the high-price movement, the market suddenly reacted and the prices are again moving upward, having at this time recovered more than half of the decline and in a few instances almost reached the old mark. This recovery is probably due to the continuance of the embargo placed by the Pennsylvania R.R. The embargo has not been absolute at any time, a number of cars being passed occasionally to meet urgent needs, and it is now thought owing to the improvement of traffic conditions within the city that it will be removed entirely within a short time.

Among the more important shippers the wish is quite general that the market return to normal conditions. They chafe under the accusation of exacting exorbitant profits, and much unpleasantness results over the high prices necessary to be charged on spot coal. Those houses who are strictly abiding by their contract obligations claim that on account of the increasing cost of production that this coal is actually being delivered to their customers at a loss.

The opinion is slowly gaining ground that very little relief can be expected from the closing of Lake navigation. The closing date has been officially extended 20 days from Nov. 20, but the sudden occurrence of zero weather in the Northwest may even compel an earlier closing than usual.

There is quite a little tide business offering, but owing to the scarcity of vessels and the high rates very little has been closed lately. The prices prevailing at this time per gross ton at the mines are about as follows:

| | |
|------------------------------|-------------|
| Georges Creek Big Vein..... | \$6.50@7.00 |
| South Fork Miller Vein..... | 6.50@7.00 |
| Clearfield (ordinary)..... | 5.75@6.25 |
| Somerset (ordinary)..... | 5.75@6.25 |
| West Va. Freeport..... | 5.00@5.50 |
| Fairmont gas, lump..... | 5.00@5.50 |
| Fairmont gas, mine-run..... | 4.75@5.00 |
| Fairmont gas, slack..... | 4.50@4.75 |
| Fairmont lump, ordinary..... | 5.00@5.25 |
| Fairmont mine-run..... | 4.60@4.85 |
| Fairmont slack..... | 4.50@4.75 |

NEW YORK

Anthracite easier and prices lower, but demand strong. Production low owing to labor and car troubles. Bituminous in good demand and prices strong. Bunker contracts soon to expire.

Anthracite—There is not so much uneasiness in the anthracite market. Prices for individual coal have receded somewhat but the position of the market continues strong. Notwithstanding the apparent ease supplies are moving rapidly and there is little opportunity for accumulation. The market depends entirely on weather conditions and prices change daily. Retailers have poor supplies and are bombarding the shipping offices. Consumers are not buying so heavily now that the operators have assured them there will be no coal famine.

The greatest pressure is for stove coal, with egg a close second. Straight cargoes of either size are not to be had and all buyers must take mixed lots. Some shippers occasionally find themselves with sufficient chestnut on hand to permit of a straight cargo of that size being shipped and prices are said to have been slightly shaved in one or two instances.

Production is slow and mines are frequently idle for one reason or another. November production is expected to run behind that for the corresponding period of 1915. Shipments to the Lakes continue heavy but these will stop about Dec. 5 when much of that tonnage will be diverted to Tidewater.

The demand for the steam coal continues strong, due in part to the soft coal situation. Buckwheat No. 1 is in heavy call but contract holders are getting their full requirements. Very little free coal is to be had and the better grades are entirely out of the market. The call for rice and barley is not so urgent but prices are firm and good premiums are being obtained by independent shippers.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports are as follows:

| | Circular | Individual |
|-------------|----------|-------------|
| Broken..... | \$4.95 | |
| Egg..... | 5.45 | \$8.75@9.25 |
| Stove..... | 5.70 | 8.75@9.25 |
| Nut..... | 5.75 | 8.75@9.25 |
| Pea..... | 4.00 | 5.60@6.25 |
| Buck..... | 2.75 | 4.25@4.50 |
| Rice..... | 2.20 | 3.00@3.25 |
| Barley..... | 1.95 | 2.10@2.25 |
| Boiler..... | 2.20 | |

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—Heavy demand, car shortage and labor troubles continue to be the features of the soft-coal market. Prices are much easier at both Tidewater and the mines, but stronger than they were last week. The market has not entirely recovered the ground lost last week but the demand continues active. New England dealers are anxious to fill up and continue to have their representatives in the mining regions.

Labor troubles add to the seriousness of the situation and several mines were reported idle the early part of the week. Mine workers in other sections are uneasy. The employees of one mine demanded 15c. per ton increase but compromised on 5c. per ton. It is also reported that employees of other mines are getting ready to make other demands.

Buyers from the Pittsburgh district and further west are covering the Fairmont district making purchases almost irrespective of prices. The contract season for various bunker contracts is about to expire and operators are not anxious to renew them under existing conditions.

The lack of cars forces many mines to remain idle for two and three days a week. There is a heavy movement of cars in the ore-carrying trade while a great many are being used in the Lake trade.

Current quotations, per gross ton, f.o.b. Tidewater, for various grades are as follows:

| | St. George | Port Reading | Mine Price |
|-----------------|-------------|--------------|-------------|
| Georg's Crk. | | | |
| Big Vein..... | \$6.75@7.50 | \$6.75@7.50 | \$5.50@6.00 |
| Tyson..... | 6.50@7.00 | 6.50@7.00 | 5.20@5.50 |
| Clearfield..... | 6.50@7.00 | 6.50@7.00 | 5.20@5.50 |
| South Frk..... | 6.75@7.25 | 6.75@7.25 | 5.40@5.70 |
| Nanty Glo..... | 6.50@7.00 | 6.50@7.00 | 5.20@5.50 |
| Som'r. Co..... | 6.50@7.00 | 6.50@7.00 | 5.20@5.50 |
| Que'ho'ing..... | 6.50@7.00 | 6.50@7.00 | 5.20@5.50 |
| W. V. Fairm't | | | |
| Th'r'qua..... | 6.25@6.75 | 6.25@6.75 | 5.00@5.50 |
| Mine-run..... | 6.25@6.75 | 6.25@6.75 | 5.00@5.50 |
| West. Md..... | 6.50@7.00 | 6.50@7.00 | 5.20@5.50 |

BALTIMORE

Market has wide range but is still generally strong. Cars remain scarce and demand again grows. Export movement improves. Hard coal men busy.

Bituminous—The recent downward movement in prices caused by the better car supply was quickly checked by another big falling off in the supply of empties in the mining regions. The early part of this week saw only a 20 to 40% supply in the Somerset and Fairmont regions. In the Clearfield region still another element arose when many of the men walked out on a list of grievances, despite the fact that they were offered a substantial increase in pay.

Prices to the trade at the mines are about as follows: Georges Creek, Tyson, \$6.25; Somerset, \$5.50; South Fork, \$5.50; Clearfield, \$6; Quema-honing, \$5.50; Latrobe, \$4.25@4.50; Freeport, \$4.25; Fairmont gas, 3/4, \$4.75; mine-run, \$4.50; slack, \$4.25.

Anthracite—Weather around the freezing mark has caused quite an impetus in late household buying. Many dealers are still back on deliveries. No. 3 hard, which is generally used in heating furnaces here, is in very heavy call and is scarce.

Exports—The export movement the past week showed improvement. The total foreign loading was 17,659 tons, and promises to be heavier the present week. Official figures for October export movement from Baltimore show that it totaled 59,530 tons.

PANAMA CANAL

Fuel movement through the canal for the two weeks ended Nov. 4 was as follows:

| Vessel | From | To | Tons |
|------------|-----------|---------------|-------|
| Brazil | Norfolk | San Francisco | 3,889 |
| Olivegrave | Barry | Esquimalt | 5,100 |
| Sherman | Baltimore | Valparaiso | 5,700 |
| Bayard | Norfolk | Tiburon | 4,863 |
| Kirkdale | Norfolk | Arica | 6,830 |

1 Coke and general cargo.

Gross shipments of coal through the Canal for September amounted to 40,553 tons as follows: Liverpool to Valparaiso, 10; Norfolk to Calita Colusa, 3,486; Norfolk to Pisagua, 3,869; Norfolk to Valparaiso, 5,000; Newport News to Taltal, 5,189; Newport News to Iquique, 6,000; Norfolk to Manila, 5,000; Norfolk to Mejillones, 3,391; Baltimore to Coquimbo, 2,019; Norfolk to Guayaquil, 2,248; Colon to Valparaiso, 90.

Gross shipments coke amounted to 9,395 tons as follows: Baltimore to Antofagasta, 1,701; Norfolk to Valparaiso, 4,381; Baltimore to Coquimbo, 3,313.

HAMPTON ROADS

Marked increase in exports. Shipments in other directions below normal. No improvement in movement from mines. Prices show slight advance.

On account of the arrival of a number of steamers and the completion of the assembling of several cargoes, exports for the present week are the heaviest since the present shortage of coal appeared. The bulk of the tonnage exported is to the Plate, the West Indies and the Mediterranean. It is still no uncommon sight to see a steamer shifting to the different terminals to complete loading on account of the shortage. Demands at the Panama Canal have been so heavy recently that two commercial steamers have been loaded for Cristobal to supplement the service of the two Panama Canal colliers.

With the exception of exports, however, the tonnage moved is below normal, due to the shortage of coal at Hampton Roads. Coastwise steam-

ers, schooners and barges are meeting with delay. Up to the present the car supply and Tidewater movement on the Virginian Railway has been better than either the Norfolk & Western or Chesapeake & Ohio. It now seems that the heavy movement of cotton and peanuts along the line of the Virginian is delaying the movement of coal trains to a serious extent.

The bunker prices for the year beginning Jan. 1 next will be on the basis of \$5 f.o.b. Charleston shippers are not quoting any prices for bunker coal over next year. Prices here are at about the same level as last week and are firmly maintained. Bunker coal for immediate delivery shows an increase of 50c. per ton.

Prices at this writing are as follows: Pocahontas and New River run-of-mine for cargo shipment, both coastwise and foreign, \$7.50@8 per gross ton; on track for local consumption \$7.50 per net ton; bunker coal, \$8@8.50 per gross ton; anthracite, \$9 per net ton delivered.

Ocean Shipping

VESSEL CLEARANCES

The following vessels have cleared with coal cargoes during the past week:

NORFOLK

| Vessel | Destination | Tons |
|-----------------------------|------------------------|--------|
| Ulysses ¹ | Cristobal, C. Z. | 12,059 |
| Ameland ¹ | Cristobal, C. Z. | 4,909 |
| John Blumer ⁷ | La Plata, A. R. | 2,706 |
| Teviotdale ³ | Buenos Aires, A. R. | 4,570 |
| Kensington ³ | Ibuey, A. R. | 2,775 |
| Giuseppe G. ¹ | Genoa, Italy | 4,637 |
| Bintang ⁴ | Cristobal, C. Z. | 7,826 |
| Virginia ¹ | Genoa, Italy | 3,212 |
| Bizkargi Mendi ⁴ | Buenos Aires, A. R. | 3,692 |
| Oregonian ¹ | Rio de Janeiro, Brazil | 7,396 |
| Jos. J. Cuneo ³ | Kingston, Jamaica | 381 |
| Jos. J. Cuneo ³ | Sagua de Tamamo, Cuba | 381 |
| Rio Amazonas | Pernambuco, Brazil | 2,002 |
| Achilles ¹ | Cristobal, C. Z. | 12,058 |
| Cuthbert ¹ | Para, Brazil | 1,047 |
| Cuthbert ¹ | Manaos, Brazil | 1,466 |
| Berlin ³ | Havana, Cuba | 2,644 |

NEWPORT NEWS

| | | |
|--------------------------------|---------------------------|-------|
| Elizabeth Weems ² | Santiago, Cuba | 1,201 |
| Noliseum ¹⁰ | Dakar, F. W. A. | 7,812 |
| Adlerney ⁴ | Valparaiso, Chile | 2,100 |
| Munorway ² | Havana, Cuba | 5,930 |
| Canada ² | Manzanillo, Cuba | 327 |
| Port Antonio ¹¹ | Santa Marta, Colombia | 1,099 |
| Belmont ¹ | Alicante, Spain | 2,466 |
| Grove ³ | Cayo Francis, Cuba | 1,458 |
| Tordenskjold ² | Cienfuegos, Cuba | 4,825 |
| Wm. E. Litchfield ² | Puerto Plata, San Domingo | 743 |
| Forde ² | Cienfuegos, Cuba | 3,000 |
| Ledaal ² | Santiago, Cuba | 2,995 |

PHILADELPHIA

| | | |
|-----------------------|------------------|-----|
| Bratland ² | Havana | |
| Wih. Colding | Antilla | |
| Mary A. Hall | St. Johns, N. B. | 341 |

BALTIMORE

| | | |
|---|--------|-------|
| Wilmore | France | 7,059 |
| Claveresk | Cuba | 6,100 |
| Corinthia | Brazil | 4,500 |
| * Pocahontas Fuel Co. * Berwind-White Co. | | |
| * Castner Curran & Bullitt. * Baker-Whiteley Co. | | |
| * Smokeless Fuel Co. * Crozer Pocahontas Co. | | |
| * Houston Coal Co. * C & O Coal & Coke Co. | | |
| * New River Coal Co. * C. H. Sprague & Son. | | |
| * West Virginia Coal Co. | | |

OCEAN CHARTERS

Coal charters have been reported as follows during the past week:

PHILADELPHIA

| Vessel | Destination | Tons | Rate |
|----------------|--------------|------|--------|
| Henry Tegner | Puerto Padre | | |
| I. M. Haynes | Cienfuegos | | |
| E. G. Briery | Cienfuegos | | |
| Thos. L. James | Gibara | 329 | \$5.50 |

BALTIMORE

| | | | |
|----------------------------|-------------|-------|-------|
| Claveresk | Felton | 2,441 | |
| Ocean Monarch ¹ | Chile | 2,945 | 7.92 |
| Loursham ² | Callao | | |
| Claveresk | Felton | | |
| Kageshima | River Plata | 3,372 | |
| Maru ¹ | River Plata | 1,970 | |
| Adlerney | Port Limon | 1,459 | |
| Sungstad | River Plata | 2,900 | 12.60 |

VIRGINIA

| | | | |
|------------------------|-------------|-------|--------|
| Malcolm Baxter, Jr. | Cuba | 1,479 | |
| Grove | Caibarien | 665 | |
| Glendbu | Rio Janeiro | 2,629 | *12.00 |
| Simon | River Plata | 1,024 | 10.80 |
| Ledall | Santiago | 1,359 | |
| Frontenac ² | Cienfuegos | 1,457 | 5.00 |

ATLANTIC RANGE

| | | | |
|---|-------------|-------|-------|
| Oregon ² | River Plata | 2,900 | 13.00 |
| * Or Virginia. * November or December. | | | |
| * 750 tons per day discharge. | | | |

OCEAN FREIGHTS

The freight market on coal to all destinations continues to advance, principally owing to the scarcity of available steamers, and the indications are that freight rates will reach still higher levels. Since our last report the Danish motor boat "Oregon," 7,500 tons, 10% was chartered, from Virginia to a Lower Plate port, we think at \$12, as this is the rate that owners were asking, although the charter was reported at a higher figure. This is probably the last of the reasonable boats desiring Plate coal, although occasionally, we have steamers willing to accept less than the market rates, when they are obliged to take business to a particular destination. None of the other fixtures completed during this period have been reported.

We would quote freight rates on coal by steamer as follows:

| | Nov. 13 | Nov. 20 |
|------------------------------|---------------|---------------|
| West Coast Italy.... | \$24.00@26.40 | \$26.40@28.80 |
| Marseilles..... | 24.00 about | 25.20@27.60 |
| Barcelona ² | 20.40@21.60 | 21.60@24.00 |
| Montevideo..... | 13.20 about | 13.20@14.40 |
| Buenos Aires..... | 13.20 about | 13.20@14.40 |
| Rosario..... | 14.40 about | 14.40@16.80 |
| Rio Janeiro..... | 11.00 about | 11.50@12.00 |
| Santos..... | 11.50 about | 12.00@12.50 |
| Chile (good port).... | 8.00 about | 8.00 about |
| Havana..... | 4.00 about | 4.00 about |
| Cardenas, Sagua.... | 5.50@6.00 | 5.50@6.00 |
| Cienfuegos..... | 6.00@6.50 | 6.00@6.50 |
| Port au Spain..... | 7.50 about | 7.50@8.00 |
| St. Lucia..... | 7.50 about | 7.50@8.00 |
| St. Thomas..... | 6.50@7.00 | 6.75@7.25 |
| Barbados..... | 7.50 about | 7.50@8.00 |
| Kingston..... | 6.50 about | 6.50@7.00 |
| Curacao..... | 6.75 about | 7.00@7.25 |
| Santiago..... | 6.00@6.50 | 6.50@7.00 |
| Guantanamo..... | 6.00@6.50 | 6.50@7.00 |
| Bermuda..... | 5.00@6.00 | 5.00@6.00 |
| Vera Cruz..... | 6.00@7.00 | 6.50@7.50 |
| Tampico..... | 6.00@7.00 | 6.50@7.50 |

* Spanish dues for account of cargo. * And p.e.

* Or other good Spanish port.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

COASTWISE FREIGHTS

From Hampton Roads there are very few current charters. One or two large schooners have been closed on private terms, but \$2 continues the sentimental quotation on all kinds of tonnage to Boston. From Philadelphia the Schooner "Henry F. Kreger," 1,800 tons, was chartered at \$2.50 to Portland, Maine, six days to load and discharge. This is decidedly an indication of better demand for bituminous tonnage. To Providence and other Sound ports \$2 strong is asked.

Rates from New York are also firmer, \$1.70 being quoted to New Bedford, and \$2@2.25 to Boston. To Salem or Portland \$2.25@2.50 is asked. Slow loading is the rule at all the piers, but tonnage continues to be taken in liberal volume; \$2.50 was again paid to Bar Harbor this week and \$3 to the Kennebec.

Lake Markets

PITTSBURGH

Complete recovery from recent weakness in the spot market. Transportation conditions no worse but strenuous efforts aided by favorable weather have effected no improvement.

The weakening in the market of week before last which made it uncertain at the middle of last week whether prices would decline further or would advance, is now practically forgotten. The movement in coal is much restricted, it being almost impossible to ship to certain markets, but car supplies are so light and demand in the districts that can be reached so heavy that there is a ready market in one direction or another for all the coal the mines can load. There are wide divergencies in the price of spot coal depending on which division it is on, but a general average places the spot market at \$4.75@5 for steam and \$5@5.25 for gas, with slack a shade lower. This is a general appraisal of the whole situation. Frequently coal is sold for less, while often it brings higher prices, when it is in an especially good position for shipment to a consuming market.

The railroads are making the most strenuous efforts to relieve the situation, both by endeavoring to use their facilities to the best advantage and also by bringing the greatest moral pressure upon shippers and consignees to handle cars promptly, but although aided by unprecedentedly favorable weather considering the season of the year, the most that can be said is that they have possibly kept the situation from growing worse. The congestion at the Lake front is somewhat relieved, but as general conditions are no better there is less to hope for from the season of Lake navigation ending.

We quote the spot market generally at \$4.50@4.75 for slack and \$4.75@5 for steam and \$5@5.25 for gas mine-run, per net ton f.o.b. mine Pittsburgh district.

BUFFALO

Bituminous coal is quiet. Embargoes have held up some shipments and diverted others. Anthracite consumers still clamoring though situation is not serious.

Bituminous—There is still a quiet tone to the market, with some report of cars on track, waiting for buyers. The market fluctuates without warning and no two jobbers make the same quotations. With the uncertain rail deliveries and the changing output from day to day there is no promise of steadiness.

With the proviso that all quotations are and must be subject to unforeseen change and that any that can be made will fail to meet the views of not a few members of the trade, good average prices are as follows, per net ton, f.o.b. Buffalo:

| | |
|-----------------------------|-------------|
| Youghiogheny Gas..... | \$6.50@7.00 |
| Pittsburgh Steam..... | 6.25@6.75 |
| Ohio No. 8..... | 6.25@6.75 |
| Allegheny Valley..... | 5.95@6.45 |
| Pennsylvania Smokeless..... | 5.85@6.35 |
| All Slack..... | 5.50@6.00 |

These quotations are primarily for three-quarter and slack, but all sizes have lately sold at about the same prices.

Anthracite—The local jobbers have advanced prices 25c. a ton on all sizes, making grate \$5.90; egg and stove, \$6.15; chestnut, \$6.40; pea, \$5.15, and buckwheat, \$3.75. This will no doubt oblige the retailers to go up a similar amount. They have had a margin of only 85c. a ton, which is regarded as too small, though it is said that there was some cutting of the prices.

The demand for anthracite over the city is as insistent as ever, though it is hard to say who is really in need, for all sorts of pressure has been used to obtain coal. Shippers are not disturbed over the situation, as they believe that the mines will be able to meet the actual demand. In about ten days the Lakes will close and 100,000 tons a week of anthracite will be added to the Eastern market.

Lake shipments are about as formerly, 88,419 net tons for the week, of which 26,500 tons cleared for Chicago, 22,300 tons for Milwaukee and 12,200 tons for Duluth and Superior. Lake rates are easy at \$1 to 75c. to Lake Michigan ports and 40 to 30c. to Lake Superior. An effort is to be made to continue the movement by Lake as late as possible, as the coal is moving out from the upper docks very rapidly.

TORONTO, CAN.

Market shows some improvement. Deliveries better, but scarcity still prevails. Wholesale prices unsettled.

Conditions show some improvement and consignments of coal are coming forward more freely though supplies are still very short, especially of anthracite, shipments of which are far behind. Prices are easier and the market less panicky, but dealers are making practically no new contracts and generally delivering only in small quantities. Quotations for best grades per short ton are as follows: Retail anthracite, egg, stove and nut, \$9; grate, \$8.75; pea, \$8; bituminous steam, \$9; slack, \$8.50; domestic lump, \$10; cannel, \$10. Wholesale prices are too unsettled to allow of quotations.

DETROIT

New embargoes threaten further reduction in the supply. Low temperature stimulates demand for domestic grades. No increase in Lake movement.

Bituminous—Detroit suffers a further curtailment in its coal supply through the action of the Big Four R.R. in raising an embargo against re-consigned coal in the attempt to clear its tracks in Toledo and elsewhere. The movement has been delayed by congested freight conditions in Detroit. The efforts to relieve the local situation have been continued and some progress is being made, though slowly.

There is a strong demand for steam coal which jobbers and wholesalers are unable to supply fully, though they have been able, with much difficulty, to get some coal to all those in urgent need. The price of any size nominally carries a mine quotation of about \$5.50, though the selling price appears to show some variation.

Little or no Hocking lump is obtainable and the situation is about the same as regards smokeless, Jackson Hill and West Virginia lump. The low temperature that now prevails in this section has brought a stronger demand for domestic stock, finding many of the retail yards unable to supply the coal.

Anthracite—Stove size is perhaps even more scarce than egg or chestnut. Shipments are light and the amount of coal coming to Detroit is not equal to the consumption at present. Retailers are endeavoring to provide for all their customers by cutting down delivery on orders to small amounts. Prices are unchanged.

Lake Trade—The carrying rate on iron ore for next season was fixed last week at \$1 free from the head of Lake Superior to ports on Lake Erie. This is double the contract rate for the present season, though during the greater part of this season \$1 free has been paid carriers on ore not included in season contracts.

The increase in ore rate has special significance for coal shippers as it indicates a probable cor-

responding increase in coal cargoes handled in 1917. The contract rate to the head of Lake Superior was 30c this year, though higher rates were paid on shipments outside the contracts, while on coal taken to Chicago \$1 has been paid.

Only a small amount of coal is now being moved by boat and the outlook is that heavy rail shipments will be necessary. Milwaukee's supply of hard coal was 199,811 tons less Nov. 1 than on that date last year, a deficiency of about 25 per cent. Soft-coal receipts at that port on the same date were 25,219 tons less than last year, the total being 3,159,919 tons.

CLEVELAND

Accumulations cleaned up and local market showing tendency to come back. Railroads asking for more fuel for winter storage. Lake Michigan coal dock owners endeavoring to secure all-rail shipments. Car supply some better.

The local market is showing a tendency to come back after taking a drop of \$2 on practically all grades of steam coal. Prices have again advanced about \$1 since the slump, most of the coal now bringing \$5 f.o.b. Cleveland. The large accumulations on roads entering here are being cleaned up in good shape, and as the heavier receivers have all been embargoed the market has been receiving only a scant daily supply. A three days' snowstorm helped considerably in stiffening the market when it was the weakest, and continued cold weather will eat into stockpiles very rapidly.

It is reported that all steam railroads have very little coal stored. Their fuel requirements increase with cold weather and they will endeavor to store coal at points along their lines.

While the local market suffered a depression for more than a week, the price for mine shipment did not decline for more than three days, it taking this long for shippers to find other markets for their coal. The Buffalo market, for re-conignment East, held up in good shape, with a fair demand for Ohio coals. The Michigan market, which was trying to force the Ohio shippers to compete with Illinois coals quoted at about \$2 less than the Ohio product, is now coming back, due to the increased demand from the Chicago market.

Lake Michigan coal dock owners, who have not received their full contract requirements by water, are now endeavoring to get the balance due them all-rail. While the all-rail freight rate will cost them from 35 to 60c. per ton more, they will still be in position to make a handsome profit under the existing market conditions.

One feature of the market is the differential between slack and coarse coals, slack bringing about 50c. per ton less than coarse coal. Heretofore the differential has not been maintained to any extent. The car supply is a trifle better on all railroads.

The Valley Camp Coal Co. has contracted with the City of Cleveland to furnish 45,000 tons-slack, for one year from Nov. 1, at \$3.50 per net ton f.o.b. Cleveland. The price on same contract last year was \$1.67 per net ton.

Following are the market prices per short ton, f.o.b. Cleveland:

| | Three-quarter | Mine-run | Slack |
|-----------------|---------------|----------|--------|
| No. 8..... | \$5.00 | \$5.00 | \$4.50 |
| Cambridge.... | 5.00 | 5.00 | 4.50 |
| Middle Dist.... | 4.75 | 4.75 | 4.50 |
| Hocking..... | 4.75 | 4.75 | 4.50 |

CINCINNATI

Cold weather has stimulated domestic demand materially, and brought about production of more screenings. Cars remain scarce, however, and this is the chief market factor.

Sudden and relatively severe cold weather caused a rush of domestic consumers and retailers, and brought about the best domestic business which has yet been seen. Many mines which had practically discontinued the preparation of domestic sizes have resumed making the various sizes of lump, and more screenings have consequently been available.

There is so far no improvement whatever in the car supply, notwithstanding optimistic predictions. Prices, therefore, remain at high levels, steam buyers taking all offerings, regardless of grade or kind. Pocahontas is bringing \$5.50@6 per ton f.o.b. mines for any grade suitable for steam production, and Kanawha is quoted at \$4.50@5, in the same way, with the better eastern Kentucky coals, such as Miller's Creek, at the same level.

COLUMBUS

The colder weather has instilled renewed strength in the trade. Prices high and supplies are short.

The lull caused by the recent warm weather has now entirely disappeared under the influence of lower temperatures and the trade is now showing more strength than at any previous time. Car shortage still continues and there is a marked scarcity of stocks in many localities.

The domestic trade is now attracting more attention than any other department. Retailers are short of stocks, as they have been holding off in the hope that the market would break. When prices were lower during the warm spell some orders were placed, but in many cases orders

were delayed because of hopes of still lower levels. The cold snap which appeared more than a week ago has again stiffened the demand to a point where almost any price is offered for quick deliveries. Customers are begging for coal and are indifferent as to grade or name. Anthracite is high, being quoted about the \$10 market retail.

Steam users have been trying to accumulate a surplus, but their efforts have generally met with failure. The car shortage is growing worse instead of better, and in some instances plants have been compelled to suspend operations because of lack of fuel. To make matters worse, natural gas supplying manufacturing establishments has been shut off in most instances and coal had to be secured quickly. Railroads are taking a large amount of fuel for the operation of trains.

The Lake trade is still active, when the lateness of the season is taken into consideration. Lake prices are extremely high. Chartering of boats is going on actively for the coming season.

Prices on short tons, f.o.b. mines, are as follows:

| | Hock-ing | Pom-eroy | Eastern Ohio |
|-------------------------|----------|----------|--------------|
| Rescreened lump..... | \$5.00 | \$5.00 | |
| Inch and a quarter..... | 5.00 | 5.00 | \$5.00 |
| Three-quarter inch..... | 5.00 | 5.00 | 5.00 |
| Nut..... | 5.00 | 5.00 | 5.00 |
| Egg..... | 5.00 | 5.00 | |
| Mine run..... | 4.75 | 4.75 | 5.00 |
| Nut, pea and slack..... | 4.50 | 4.50 | 4.75 |
| Coarse slack..... | 4.50 | 4.50 | 4.75 |

LOUISVILLE

Eastern Kentucky field has the longest week's run since July. Cars more numerous and prices softening. Probable lifting of embargoes favors an active market.

A more plentiful supply of coal equipment in the eastern Kentucky field has given the operations a better run than at any time since last July, when the car shortage began to be troublesome. Southern territory has been pretty well supplied and prices have been showing a tendency to soften. Lifting of the Louisville & Nashville embargoes on shipping northward, which is expected any day, will strengthen prices. The embargo has been most severe, all foreign equipment having practically left the coal-carrying roads. Western Kentucky operators find little improvement in the car supplies and are not able as yet to make full deliveries on contracts, as a rule.

High prices of eastern Kentucky coals have brought more western Kentucky grades to Louisville, where there has been no competition from the river supply up to this time. Prices on eastern Kentucky, f.o.b. the mines, are quoted: Block, \$3.50@4; mine-run, \$3.25@3.75; nut and slack, \$3@4.

Sales from the western Kentucky field have been reported on lump at \$2.50@3; mine-run, \$2.75@3.50; nut and slack, \$2@2.50.

BIRMINGHAM, ALA.

Steam and domestic prices show further advance. Car supply perceptibly better with some lines. Promise of more equipment causes numerous small mines to resume operations.

The condition of the market still precludes quotations being given, but steam coal is now selling from \$4.50 to \$5 per ton mines. The market is strong and consumers are having difficulty securing sufficient coal to supply their actual needs and are unable to stock up as much as they would like to. One of the mines of the district is reported to have been offered a very handsome premium to tie up its output for a period of six months on the basis of \$3 per ton mines, which is indicative of the unanimous opinion that prices will not touch the low levels which prevailed the early part of the year, any time soon.

Domestic trade has shown further improvement as a result of the cold weather and the best grades of domestic coal are now quoted at \$5 per ton, mines, and the market is in a most satisfactory condition, barring the shortage of equipment and labor, which is holding down the production. Stocks are not large and difficulty is being experienced in efforts to increase them.

Coke

CONNELLSVILLE

Steel interests refuse to pay fancy prices. Market not well defined. High prices paid for foundry coke. Production and shipments increased.

What seems to amount virtually to a strike on the part of furnace coke consumers has now been in progress for more than a week. The steel interests that were bidding against each other and paying fancy prices for spot furnace coke decided to stop and it has been very difficult the past week to sell any spot furnace coke. Occasional sales have been made of small lots to consumers in a special position, but in general there has not been enough done to establish a regular trading market. The consumers are keeping their own counsel and it is impossible to determine whether they have had sufficient coke or have slowed down their furnace operations so as to consume merely the coke that reached them on regular contracts. Spot furnace coke prices are virtually nominal.

In spot foundry coke there has been a fair trade, consumers having no price limit and sellers maintaining former levels. A contract has been made at the new high price of \$6.50, a price named last week as merely an asking figure.

The future of the coke market no longer hinges upon the relation between consumptive demand and supply, as the larger question of what buyers will pay, even if they really need the coke, has intervened. We quote the market roughly as follows: Spot furnace, \$6@7; contract, \$4; spot foundry, \$9.50@10; contract, \$5.50@6.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Nov. 11 at 421,513 tons, an increase of 13,231 tons, and shipments at 405,973 tons, an increase of 8,909 tons.

Buffalo—The demand is good and shippers are making a great effort to get a supply. It now looks as though there would be no further advance in prices, which are now based on \$10 for foundry and furnace and \$9 for high sulphur and stock, f.o.b. Buffalo. Cars are very scarce and there is no apparent disposition on the part of furnaces to reduce operations. Everything is running at full capacity.

Birmingham—Spot foundry coke has advanced sharply during the past week and is being quoted at \$5.75 per ton ovens, sales having been booked at this figure. Furnace coke is extremely scarce and little free tonnage can be had, and this is selling around \$4 per ton ovens. Furnaces in this district are running at maximum capacity and some of them are experiencing difficulty in securing sufficient coke to operate their stacks. A fair tonnage is moving to California and Texas territory, considering the difficulty in securing foreign equipment, some of the Texas business being consigned to brokers for customers in old Mexico.

Chicago—Prices have wildly fluctuated. One large producer has announced that no orders will be booked for any size except nut before Jan. 1. It is difficult to quote prices on any grade, but nominal figures per net ton f.o.b. cars Chicago, are approximately as follows:

| | |
|--------------------------|--------------|
| Connellsville | \$9.00@10.50 |
| Wise County | 9.00@10.50 |
| Byproduct foundry | 9.50@11.00 |
| Byproduct domestic | 8.50@10.00 |
| Gas house | 6.75@ 8.00 |

Middle Western

GENERAL REVIEW

Demand for all sizes continues heavy. Cold snap intensifies situation. Country retailers buying large tonnages.

The market is stronger than last week, with new price records being established. Unheard of premiums are being paid for quick shipment of free tonnage to both normal markets and at points where these coals have never before been sold. Steam coals seem to be the dominant force and many buyers are unable to meet even a part of their requirements.

A sudden cold snap this week accentuated the demand for domestic sizes. Country retailers who have been holding off, hoping the market would be easier, have suddenly commenced buying heavily. The car situation is becoming progressively worse, the supply now averaging only about 40 per cent. of needs. Operators are receiving three times as many orders as the car supply will permit them to deliver within a reasonable time.

An increased percentage of Western coal is being shipped into Eastern territory, notwithstanding railroad embargoes; this coal is sold at even higher prices than quoted to the Western trade. There is a larger demand evinced from the Northwest, and inquiries are now being received from British Columbia buyers.

Free coal is noticeably short, and a majority of shippers are running behind on their contracts. Some public service corporations have been short of stocks, and several Western railroads have been after their operators for additional tonnage.

CHICAGO

Colder weather accentuates local domestic demand. Free coal scarce. Prices show no relaxation.

Southern Illinois screenings are ranging from \$3.35 to \$3.75, with other prepared sizes varying from \$3.50 to \$4.50. Cold weather has brought a number of orders from country dealers, who up to this time would not buy at the prevailing high prices. The car shortage in Williamson and Saline Counties is growing worse, and as a consequence free tonnage is lessened. Spot prices are about the same as for Franklin County coal.

Central Illinois mines received about 60 per cent. car supply this week. Prices on all grades are very strong. No lump coal has been sold below \$3.50, and the minimum price on screenings has been \$3.25. There is talk of further advances on Springfield coal next week. In Fulton and Peoria Counties there is very little free coal, and some screenings have been shipped to Chicago at a price of \$3.50 per ton. Quotations have been withdrawn on spot coal and prices are made only on request.

Shortage of railroad equipment at the Indiana mines is acute, though officials are promising that something will be done in the near future to relieve the situation. Orders for Indiana coal from Michigan points are being received in increasing numbers owing to the railroads not allowing equipment to go into Michigan from Illinois mines. Labor difficulties have also confronted the operators. Shipments to Chicago have been in reduced quantities. Lump and mine-run is selling around \$4, with screenings worth \$3.50 at the mines.

Smokeless shipments under contracts to Chicago territory approximate 60 per cent. of specifications. Open market business on smokeless coals is inactive because of the little tonnage arriving. Quotations in the Chicago market are as follows, per net ton f.o.b. cars at mines:

| | Springfield | Fulton & Peoria Cos. | Clinton & Sullivan Cos. | Green & Knox Cos. | Cartersville |
|--------------------|-------------|----------------------|-------------------------|-------------------|--------------|
| Domestic lump..... | \$3.25@3.75 | \$3.50@4.00 | \$3.50@4.00 | \$3.50@4.00 | \$3.75@4.00 |
| Steam lump..... | 3.00@3.50 | | 3.00@3.75 | | |
| Egg..... | 3.25@3.75 | 3.50@4.00 | 3.50@3.75 | 3.50@4.00 | 3.75@4.00 |
| Nut..... | 3.25@3.75 | | 3.25@3.75 | | |
| Mine-run..... | 3.00@3.50 | 3.00@3.50 | 3.25@3.75 | 3.25@3.50 (1) | 3.75@4.00 |
| Screenings..... | 3.25@3.50 | 2.75@3.50 | 3.25@3.50 | 3.25@3.50 (5) | 3.50@3.75 |

| | Wilmington & Franklin Cos. | Saline & Harrisburg | Poca. & W. Va. Smokeless | Penna. Smokeless | Eastern Kentucky |
|-------------------|----------------------------|---------------------|--------------------------|------------------|------------------|
| Lump..... | \$3.50@4.50 | \$3.50@4.50 | \$5.50@6.00 | \$5.50@6.25 | \$4.25@5.00 |
| Egg..... | 3.50@4.00 | 3.50@4.00 | 5.50@6.00 | 5.50@6.25 | 4.00@5.00 |
| Nut..... | | 3.50@4.00 | | | 3.50@5.00 |
| No. 1 nut..... | 3.50@4.50 | | | | |
| No. 2 nut..... | 3.25@3.75 | | | | |
| No. 3 nut..... | 3.00@3.75 | | | | |
| No. 1 washed..... | 3.50@4.50 | 3.50@4.50 | | | |
| No. 2 washed..... | 3.25@3.75 | 3.25@3.75 | | | |
| Mine-run..... | 3.50@4.00 | 3.50@4.00 | 4.50@5.25 | 4.25@5.25 | 4.00@4.50 |
| Screenings..... | 3.25@3.75 | 3.25@3.75 | | | |

Hocking Lump @ \$4.50.

Splint Lump \$4.50@4.75.

(1) Washed. (5) Washed.

Anthracite is very scarce and some of the smaller companies are obtaining \$2 per ton premium. Larger companies are adhering to schedule prices. Reserve stocks have been greatly depleted and movement of all-rail tonnage is on a greatly restricted basis.

ST. LOUIS

Better demand for steam sizes and stronger prices on all domestic grades. Country demand very heavy and record prices offered. Car supply worse with nothing to indicate any relief.

Cold weather and snow has given a snap to the local market while the outside demand has also stiffened up. The local domestic demand is heavy only on Standard coal.

There has also been a spirited call from the South this week. Texas demand is good, and \$4 for Cartersville (Williamson County) lump and egg is freely paid. There is no steam demand, however, as wood and oil are cheaper.

As high as \$4.25 has been recorded for Williamson-Franklin lump and egg moving north. The screenings from the same field went to \$3.50, as did mine-run. Murphysboro Big Muddy lump is off of the market, but is quoted for future at \$5 at mines.

The feeling here is that the top has not been reached on high-grade coal yet. Locally in St. Louis \$3 is the top as cheaper coal is used when it goes higher; as a result little except contract coal is coming in. The same applies to Mt. Olive and Staunton, with prices of \$2 and \$1.85, respectively.

Local Standard 2-in. lump is not as plentiful as it has been. The record price for Standard coal was made on about 20 cars, which sold at \$4.50 at the mine for mine-run. On Standard 6-in. lump a big shipment to Omaha brought \$4 at the mines.

No records are available on receipts of smokeless and anthracite this week, but they were undoubtedly the lowest yet. A car of chestnut sold at \$2.30 over the St. Louis circular of \$7.80 this week and this was the only offering.

Local coke is in big demand and is replacing Eastern fuels.

Car supply has been worse this week on all roads. The average for the 11 trunk coal lines was not over two days, excepting the C., B. & Q., which was better than three days.

The local market, f.o.b. mine, is about as follows:

| | Williamson & Franklin Co. | Mt. Olive | Staunton | Standard |
|-------------------|---------------------------|-----------|----------|----------------|
| 6-in. lump..... | \$3.00@3.25 | \$3.50 | \$3.00 | \$3.00@3.25 |
| 3x6-in. egg..... | 3.00@3.25 | 3.50 | 3.00 | 3.00@3.25 |
| 2x3-in. nut..... | 3.00@3.25 | | | 3.00 |
| No. 2 nut..... | 3.00@3.25 | | | |
| No. 3 nut..... | 3.00@3.25 | | | |
| No. 4 nut..... | 3.00@3.25 | | | |
| No. 5 nut..... | 3.00@3.25 | | | |
| 2-in. Screen..... | 3.00@3.25 | 2.50 | 2.50 | |
| 2-in. lump..... | | 2.50 | | 3.00@3.25 |
| 3-in. lump..... | | 2.50 | | 2.75 |
| Steam egg..... | | | | 2.75 3.00 |
| Mine-run..... | 3.00@3.25 | | | 2.75 2.75@3.00 |
| Washed..... | | | | |
| No. 1..... | 3.00@3.25 | 3.50 | | |
| No. 2..... | 3.00@3.25 | 3.00 | | |
| No. 3..... | 3.00@3.25 | 2.75 | | |
| No. 4..... | 3.00@3.25 | 2.75 | | |
| No. 5..... | 2.50@3.00 | | | |

Williamson and Franklin freight rate 72½¢; others 57½¢.

KANSAS CITY

The Kansas City market is becoming more strained every day as a result of the continued car shortage. The demand is increasing and the local jobbers are asking extremely high prices for coal.

Practically all of the mines of the southern Kansas field are idle as a result of the shortage of cars. Because of the expense caused by idle days in the mines the big concerns of Kansas City and this vicinity have wired the heads of the railroads for relief in the car supply.

Domestic grades of coal from the Bevier field are selling at firm prices. The demand for these grades is heavy. Shipments are ten days behind but the question of cars in this field is not so pressing as in other fields in Missouri and Kansas.

General Statistics

COAL MOVEMENT

The following is a statement of carloads of bituminous coal and beehive coke that originated on 47 railroads in October, 1916, compiled from reports received by the Geological Survey, Department of the Interior, by noon, Nov. 15, 1916:

| | October, 1916 | September, 1916 | October, 1915 |
|---|---------------|-----------------|---------------|
| Carloads of bituminous coal..... | 418,270 | 394,576 | 463,955 |
| Carloads of beehive coke (8 roads)..... | 54,253 | 53,215 | 48,436 |

Comparative figures based on reports of 47 roads as follows: 27 roads in Eastern classification territory (including Illinois), 11 roads in Southern classification territory, 9 roads in Western classification territory.

October, 1916, showed an increase in shipments of bituminous coal of 0.6 per cent. over September, 1916, and a decrease of nearly 10 per cent. from October, 1915. The increases in shipments of beehive coke for the same month were 2 per cent. and 12 per cent. respectively.

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the Pennsylvania Railroad Co.'s lines east of Pittsburgh and Erie for October and the ten months of 1915 and 1916, in short tons:

| | October, 1916 | October, 1915 | Ten Months, 1916 | Ten Months, 1915 |
|-----------------|---------------|---------------|------------------|------------------|
| Anthracite..... | 1,156,699 | 1,084,739 | 9,986,566 | 8,679,339 |
| Bituminous..... | 3,973,141 | 4,304,466 | 40,496,441 | 35,908,943 |
| Coke..... | 1,205,013 | 1,225,848 | 12,053,243 | 9,602,356 |
| Total..... | 6,334,853 | 6,615,053 | 62,536,250 | 54,190,638 |

IMPORTS AND EXPORTS

The following is a comparative statement of coal imports and exports of the United States for September, 1915-16, and for the 9 months ended September, 1914-15-16, in long tons:

| | September, 1915 | September, 1916 | September, 1914 | September, 1915 | September, 1916 |
|------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Imports | | | | | |
| Anthracite, total..... | 134 | 99 | 18,257 | 2,524 | 4,626 |
| Bituminous, total..... | 126,282 | 125,073 | 990,284 | 1,077,799 | 1,193,328 |
| United Kingdom..... | 500 | 52 | 8,410 | 16,110 | 5,118 |
| Canada..... | 111,000 | 105,745 | 771,158 | 869,634 | 1,081,589 |
| Japan..... | 5,200 | 12,357 | 44,539 | 62,119 | 77,187 |
| Australia..... | 9,578 | 6,919 | 164,124 | 127,356 | 28,079 |
| Other countries..... | 4 | | 2,053 | 2,580 | 1,355 |
| Coke..... | 2,982 | 2,142 | 83,980 | 36,602 | 40,643 |
| Exports | | | | | |
| Anthracite total..... | 290,350 | 353,507 | 3,062,057 | 2,592,749 | 3,200,512 |
| Canada..... | 277,143 | 349,887 | 3,017,158 | 2,538,865 | 3,130,340 |
| Argentina..... | 134 | 135 | | 2,469 | 1,530 |
| Brazil..... | | | 6 | 2,415 | 428 |
| Uruguay..... | | | | 605 | |
| Other countries..... | 13,073 | 3,485 | 44,893 | 48,395 | 68,214 |
| Bituminous total..... | 1,832,977 | 2,003,353 | 10,902,780 | 12,424,132 | 14,766,023 |
| Italy..... | 324,925 | 94,430 | 2,348,870 | 2,348,870 | 1,529,639 |
| Canada..... | 944,800 | 1,356,741 | 7,241,856 | 5,682,455 | 9,095,203 |
| Panama..... | 59,969 | 48,082 | 214,131 | 389,419 | 303,036 |
| Mexico..... | 21,787 | 20,641 | 257,380 | 240,603 | 154,283 |
| Cuba..... | 109,269 | 124,629 | 793,898 | 843,805 | 984,614 |
| West Indies..... | 44,835 | 18,506 | 479,923 | 353,440 | 340,500 |
| Argentina..... | 56,305 | 91,147 | 193,786 | 719,019 | 726,075 |
| Brazil..... | 61,223 | 87,477 | 201,071 | 544,194 | 621,655 |
| Uruguay..... | 4,275 | 25,841 | 61,443 | 135,065 | 129,314 |
| Other countries..... | 205,589 | 135,859 | 1,459,292 | 1,167,262 | 881,704 |
| Total coal..... | 2,123,327 | 2,356,860 | 13,964,837 | 15,016,881 | 17,966,535 |
| Coke..... | 59,395 | 95,571 | 485,171 | 573,104 | 771,519 |
| Bunker coal..... | 651,154 | 739,289 | 5,711,948 | 5,678,163 | 5,959,618 |

NORFOLK & WESTERN

The following is a statement of coal handled by the N. & W. Ry. during October and the preceding two months in short tons:

| | August | September | October |
|-----------------------|-----------|-----------|-----------|
| Pocahontas..... | 1,631,263 | 1,577,193 | 1,501,217 |
| Tug River..... | 345,167 | 316,868 | 318,618 |
| Thacker..... | 286,008 | 295,628 | 267,376 |
| Kenova..... | 94,772 | 84,392 | 89,740 |
| Clinch Valley..... | 121,148 | 118,974 | 123,408 |
| Miscellaneous..... | 5,353 | 2,709 | 6,380 |
| Total N. & W..... | 2,483,711 | 2,395,764 | 2,306,739 |
| Wm. & Pond Ck..... | 111,390 | 122,939 | 105,615 |
| Tug R. & Ky. R.R..... | 55,359 | 55,605 | 57,202 |
| Other roads..... | 398,480 | 408,611 | 440,521 |
| Grand total..... | 3,048,940 | 2,982,919 | 2,910,077 |

COAL MOVEMENT

The current government report of shipments over the 13 leading coal roads for August and the first 8 months of this year shows 125,214,148 tons of bituminous coal moved for the 8-month period as compared with 103,198,434 tons for last year, making a gain of nearly 25 per cent. Shipments for the month this year amounted to 16,658,826 tons, as compared with 15,294,943 tons in August, 1915. The increase is about what was expected up to that time, but it is not likely that the gain for this month and last month will show such a big increase as the movement has been much interrupted by transportation difficulties.

Foreign Markets

GREAT BRITAIN

Nov. 9.—There is a very material alteration in the market to record. Tonnage, never too plentiful of late, has been rendered less plentiful by the continuation of severe gales, and the result has been a slump in the coal market, the effect of which may be felt for some time.

| | |
|--------------------------|--------------|
| Best Welsh steam..... | Nominal |
| Best seconds..... | Nominal |
| Seconds..... | \$7.20@ 7.80 |
| Best dry coals..... | 6.72@ 6.96 |
| Best Monmouthshires..... | 7.20@ 7.44 |
| Seconds..... | 6.96@ 7.20 |
| Best Cardiff smalls..... | 4.80@ 5.04 |
| Cargo smalls..... | 4.44@ 4.56 |

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Chartering is still inactive. Advances have been conceded to Gibraltar, and the River Plate, otherwise rates remain steady.

| | | | |
|-----------------|--------|------------------|---------|
| Gibraltar..... | \$8.40 | Port Said..... | \$14.40 |
| Marseilles..... | 14.04 | Las Palmas..... | 6.36 |
| Genoa..... | 14.28 | St. Vincent..... | 7.20 |
| Naples..... | 13.80 | River Plate..... | 7.80 |
| Alexandria..... | 15.00 | | |

Financial Department

The Girard Estate

The annual report of the mining engineer and agent of the Girard Estate, states in substance as follows:

In spite of mild weather during the winter, a light demand during the summer and a car shortage in the late autumn, the production of anthracite coal in Pennsylvania for 1915 was not much below normal, the total shipment being 67,885,995 tons, as compared with 69,776,401 tons in 1914 and the record shipment of 69,954,299 tons in 1911. The possibility of a strike, or at least a suspension of work, on Apr. 1, 1916, stimulated the demand for coal during the latter part of 1915.

Selling prices were depressed during the spring and summer, especially on pea coal, but recovered sharply in mid-autumn, so that the average prices at the breaker returned by the lessees of the Girard Estate were only 3c. per ton lower for 1915 than for 1914. The average decrease on chestnut and larger sizes was 2c., and on pea coal 20c., while there were increases on buckwheat coal of 4c., on rice coal of 2c., and on barley coal of 10c. per ton. In arriving at the averages for both years the proportions of the various sizes of fresh mined coal shipped from the Girard Estate in 1915 have been used.

The shipment of coal from the Girard Estate in 1915 was 1,961,563 tons, an increase of 58,620 tons above 1914, making its proportion of the shipments from the State of Pennsylvania 2.9 per cent., as compared with 2.7 per cent. in 1914. This increase in the Girard Estate proportion has been due to the new operations which have either started up or come to full production in 1915. The older operations have shown a decrease in production of 13 per cent., as compared with a decrease of only 3 per cent. from the state as a whole.

The shipment for November, 1915, viz.: 229,989 tons, was the largest ever made from the Girard Estate, the largest previous shipment being 226,110 tons in March, 1912.

During the fifty-three years of active mining on the estate, beginning with 1863, there has been marketed from it 65,127,334 tons. This does not include some coal mined in 1834, 1835 and 1836 from what is now the East Bear Ridge lease and shipped over the Pottsville and Danville R.R., in the building of which Stephen Girard had been the prime mover. So far as reported, the quantity of coal so shipped was 18,794 tons.

The shipment of coal from each colliery and washery during 1915 and 1914, is shown in the following table:

| Colliery | Shipments | |
|-------------------------------|--------------|--------------|
| | 1914, Tons | 1915, Tons |
| Weston..... | 153,791.17 | 326,893.10 |
| William Penn..... | 290,953.12 | 276,720.01 |
| Kehley's Run..... | 300,289.04 | 256,951.12 |
| Packer No. 1-5..... | 305,756.13 | 234,200.13 |
| Hammond..... | 271,639.01 | 229,613.14 |
| Continental..... | 147,105.08 | 154,204.14 |
| Packer No. 2..... | 129,527.13 | 123,755.17 |
| Packer No. 4..... | 92,950.06 | 92,028.17 |
| Packer No. 3..... | 122,099.03 | 90,364.12 |
| Black Creek..... | 86,567.18 | 86,567.18 |
| East Bear Ridge..... | 41,198.04 | 41,198.04 |
| West Bear Ridge..... | 9,290.14 | 20,167.12 |
| Stanton..... | 24,620.01 | 16,804.16 |
| Girard..... | 18,809.15 | 5,638.18 |
| Kimberley..... | 5,866.13 | 5,285.19 |
| West Shenandoah..... | 485.18 | 612.06 |
| Oxford..... | 29,724.10 | 512.06 |
| Preston No. 2 Culm Banks..... | 33.00 | 42.00 |
| Total..... | 1,902,943.08 | 1,961,563.09 |

If it were not for the new operations of Weston, East Bear Ridge and Black Creek, the first of which began work in 1914 and the last two in 1915, the increase shown above would have been changed to a large decrease. The East Bear Ridge breaker was put in operation on Sept. 7 and Black Creek on Aug. 13. Girard Colliery resumed work on Nov. 8, after an idleness of nearly 19 months, during which the breaker was rebuilt.

Weston colliery of the Locust Mountain Coal Co. was the only colliery on the Girard Estate whose shipment for 1915 reached 300,000 tons, and it holds first place by a large margin. William Penn colliery of the Susquehanna Coal Co. passed Packer No. 1-5 and Kehley's Run and is in second place, a position it last held in 1901. Kehley's Run colliery of the Thomas Colliery Co., also passed Packer No. 1-5 and is in third place. It was second in 1914. Packer No. 1-5 of the Lehigh Valley Coal Co., due to delay in getting its new breaker in full operation, dropped to fourth place, lower than it has been since 1898.

The total production of coal from the Girard Estate in 1915 was 2,289,994 tons, made up as follows:

| | Tons |
|---|-----------|
| Shipped to market, fresh mined..... | 1,831,155 |
| Shipped to market, reclaimed from culm banks..... | 130,408 |
| Total coal on which royalty is paid..... | 1,961,563 |
| Coal consumed in operating..... | 328,431 |
| Total production..... | 2,289,994 |

The quantity of coal consumed in operating was 14.34 per cent. of the total production, which is higher than it has been since 1902, when, owing to the strike, the production was small, while the quantity of fuel required could not be reduced correspondingly.

The larger the production the smaller, generally speaking, is the proportion of it that is consumed in operating, as shown by the table covering the last 15 years:

COAL CONSUMED IN OPERATING

| | Production, Tons | Consumed in Tons | Operating Per Cent. |
|-----------|------------------|------------------|---------------------|
| 1901..... | 1,436,114 | 188,080 | 13.10 |
| 1902..... | 774,647 | 138,482 | 17.87 |
| 1903..... | 1,701,669 | 186,455 | 10.96 |
| 1904..... | 1,857,308 | 201,290 | 10.84 |
| 1905..... | 2,010,807 | 187,909 | 9.34 |
| 1906..... | 1,895,068 | 184,797 | 9.75 |
| 1907..... | 2,290,269 | 204,943 | 8.95 |
| 1908..... | 2,178,222 | 217,331 | 9.98 |
| 1909..... | 1,977,300 | 218,915 | 11.07 |
| 1910..... | 2,116,491 | 237,861 | 11.24 |
| 1911..... | 2,420,747 | 258,700 | 10.69 |
| 1912..... | 2,215,102 | 250,243 | 11.30 |
| 1913..... | 2,245,547 | 268,818 | 11.97 |
| 1914..... | 2,198,603 | 295,659 | 13.45 |
| 1915..... | 2,289,994 | 328,431 | 14.34 |

The proportion of sizes in fresh mined coal has not varied much since 1900, in spite of the fact that the production of the small sizes of coal has been very much increased, due in part to the breaking down of the largest sizes to meet the demands of the market, but in a greater degree to the utilization of the very smallest sizes.

The total quantity of coal won by stripping in 1915 has been greater than ever before, but this was due to the very large stripping operations at Weston colliery of the Locust Mountain Coal Co., since at the other collieries, except William Penn., very little stripping was done. This is shown in the following table:

COAL WON BY STRIPPING IN 1914 AND 1915

| Colliery | 1914, Tons | 1915, Tons |
|----------------------|------------|------------|
| Weston..... | 104,975 | 158,716 |
| William Penn..... | 46,944 | 49,297 |
| Kehley's Run..... | 11,935 | 9,984 |
| Continental..... | 33,051 | 8,961 |
| Packer No. 1-5..... | 15,079 | 5,509 |
| West Bear Ridge..... | 5,117 | 5,117 |
| Packer No. 2..... | 3,821 | 3,821 |
| Girard..... | 1,426 | 1,426 |
| Packer No. 3..... | 20,053 | 172 |
| West Bear Ridge..... | 689 | 689 |
| Total..... | 232,727 | 243,007 |

The average working time in 1915 for the collieries on the Girard Estate in full operation, which excludes Packer No. 1-5, Girard, East Bear Ridge, West Bear Ridge and Black Creek, was 231 days, or 77 per cent. of full time. This is slightly less than in 1914, when the average was 78 per cent. of full time.

During 1915 development work in the mines consisted of:

| | Yd. |
|---------------|--------|
| Gangways..... | 19,333 |
| Slopes..... | 287 |
| Tunnels..... | 2,665 |

The length of tunnel driven was much more than usual, as the development of additional sources for supplying coal has been pushed since the new leases went into effect on Jan. 1, 1914. The length of gangway driven was also in excess of previous years. This is partly due to the same cause, but may also be explained by the inclusion of the many gangways driven to win coal from portions of the Mammoth bed, which had previously been worked and partially robbed. These gangways were not included prior to 1914.

The gangway driven in the last 19 years is as follows:

| Year | Miles | Year | Miles |
|-----------|-------|-----------|-------|
| 1897..... | 5.3 | 1907..... | 8.7 |
| 1898..... | 4.0 | 1908..... | 8.3 |
| 1899..... | 6.3 | 1909..... | 8.0 |
| 1900..... | 6.0 | 1910..... | 8.5 |
| 1901..... | 6.5 | 1911..... | 6.9 |
| 1902..... | 3.1 | 1912..... | 5.6 |
| 1903..... | 5.9 | 1913..... | 7.4 |
| 1904..... | 7.2 | 1914..... | 10.3 |
| 1905..... | 7.7 | 1915..... | 11.0 |
| 1906..... | 7.5 | | |

All the breakers recently erected, viz.: Weston, Packer No. 1-5, Girard, East Bear Ridge and Black Creek, are now in full operation, as is also Lawrence, through which the coal from West Bear Ridge is prepared for market. The output from these plants has materially increased the shipments and will continue to do so.

There was only one mine fire during 1915, which is the average for the 36 years during which a record has been kept. The fire in 1915 occurred at Packer No. 1-5 Colliery on Nov. 27, the result of an explosion of gas, which caused the death of two miners. The fire itself did not assume serious proportions, and was extinguished in a few hours.

Massachusetts Gas Companies

This company reports, in part, for the year ended June 30, 1916, as follows:

New England Gas and Coke Co.—The general improvement in business conditions in New England in the past year appreciably strengthened the market for the byproducts of this company, such as sulphate of ammonia and benzol. In a like degree the market for coke improved, with an increased demand for fuel and the difficulty in securing coal on account of interruptions to water and rail transportation. The company was thus able to dispose of its coke and its byproducts at prices somewhat better than those of the previous year, permitting a dividend of 4½ per cent. as compared with 3½ per cent. in 1914-15.

New England Coal and Coke Co.—During the year this company sold and delivered about 4,063,000 gross tons of coal, an increase of some 639,000 gross tons over the previous year. During the year the barge fleet was reduced by the loss of the barges "Dora" and "Irie." The losses were covered by insurance or insurance reserve.

NEW ENGLAND GAS & COKE CO.

| | 1915-16 | 1914-15 |
|---------------------------|---------------|---------------|
| Gross income..... | \$4,318,847 | \$3,708,401 |
| Operating expenses..... | 3,444,762 | 3,001,299 |
| Net income from oper..... | \$874,085 | \$707,102 |
| Interest..... | \$80,780 | \$90,469 |
| Dividends..... | (4½%) 787,500 | (3½%) 612,500 |
| Balance, surplus..... | \$5,805 | \$4,133 |

SUBSIDIARIES FOR YEARS ENDING JUNE 30, 1916

| | N. E. C. & Coke Co. | Bos. Tow. Boat Co. |
|-----------------------|----------------------|--------------------|
| Gross income..... | \$2,253,055 | \$335,034 |
| Expenses..... | 1,816,246 | 278,921 |
| Net from oper..... | \$436,809 | \$56,113 |
| Misc. income..... | | |
| Net earnings..... | \$436,809 | \$56,113 |
| Deduct | | |
| Interest..... | \$130,670 | \$4,344 |
| Dividends..... | (20) 300,000 | (12) 48,000 |
| Balance, surplus..... | \$6,139 | \$3,769 |
| | Fed. Coal & Coke Co. | J. B. B. Coal Co. |
| Gross earnings..... | \$682,520 | \$557,683 |
| Expenses..... | 564,865 | 546,533 |
| Net earnings..... | \$117,655 | \$111,150 |
| Interest..... | 44,268 | 27,124 |
| Balance..... | sur. \$73,387 | def. \$15,974 |

The New England Coal and Coke Co. owns 2,000 shares, equal to approximately 60% of the capital stock of the J. B. B. Coal Co.